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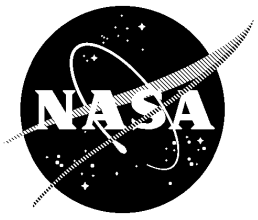
MISSION OPERATIONS AND DATA SYSTEMS DIRECTORATE

NASA Communications(Nascom) Internet Protocol (IP) Transition MDM Modification Test Plan

July 1997



National Aeronautics and Space Administration

Goddard Space Flight Center
Greenbelt, Maryland

Nascom IP Transition MDM Modification Test Plan

July 1997

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Preface

This document was written and reviewed by personnel from Codes 532.1 and 541.

Changes and updates to this document will be issued by the Nascom IP Transition Project. Questions concerning this document and proposed changes shall be addressed to :

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Abstract

The Nascom IP Transition MDM Modification Test Plan Document describes the test plans for the integration of modified MDMs at JSC and WSC into the Nascom IP Transition Internet Operations Network (IOnet). The phases are described from the Factory Acceptance Test (FAT) of the Nascom LAN Interface Card (NLIC) through Space Network (SN) user and load testing. Objectives and high level procedures are included for NLIC integration to IOnet, SOC/RFSOC testing, WSC and JSC user tests and load tests.

Keywords: MDM, IOnet, FAT , NLIC

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1. Introduction

1.1 Purpose

The purpose of the Nascom Internet Protocol(IP) Transition MDM Modification Test Plan Document is to describe the plans for verifying the integration and operation of the Modified MDMs at the White Sands Complex (WSC) and Johnson Space Center (JSC) with the IP backbone (IOnet - IP Operational Network) for transmit(MUX) and receive(DEMUX) data services. The Modified MDMs at WSC provide the interface between TDRSS and the IP backbone. The Modified MDMs at JSC provide the interface between Shuttle Users at JSC and the IP backbone.

1.2 Scope

This document describes the major testing activities leading up to the turndown of the Domsat MDM services and full operations with the IP backbone including the Modified MDMs. These engineering and integration tests are normally handled independently. This plan was produced with the cooperation of Code 532.1 and 541.

The remainder of Section 1 provides references and background. The following sections will be self-contained sections describing the what, who, where, how and tentatively when for each of the major testing activities:

Section 2 summarizes the Factory Acceptance Test (FAT). Section 3 describes the testing for the Nascom LAN Interface Card (NLIC) integration to the IP Infrastructure. Section 4 provides the general procedures for the SN Network verification testing with the IP backbone. Section 5 describes the Non-User SOC/RFSOC testing and Section 6 discusses the SN User testing both forward and return. Section 7 describes the verification of JSC service requirements. Section 8 covers network loading tests.

1.3 Applicable Documents

1) *NASA Communications (Nascom) Internet Protocol (IP) Transition Operations Concepts Document*, Nascom, 541-230, September 1996.

2) *NASA Communications (Nascom) Internet Protocol (IP) Transition Data Format Document*, Nascom, 541-231, May 1997.

3) *Nascom IP Transition Project Transition Plan*, Nascom, 541-229, June 1996.

4) *Nascom IP Transition Project MDM Modifications Data System Requirements Specification*, LMSIS, LOR-TR1981, October 1996.

5) *Nascom IP Transition Project MDM Modifications Acceptance Test Procedures*, LMSIS, SB-495562, March 1997.

6) *Nascom IP Transition Project MDM Modifications Qualification Test Procedures*, LMSIS, SQ-49563, March, 1997.

7) *VTR-STDN Network Verification Manual for the Space Shuttle Program* January 1997.

8) AFSCN Annex to the Network Operations Support Plan for the Space Shuttle Program.

9) 501-601 Network Operations Support Plan for the Space Shuttle Annex G. Tracking and Data Relay Satellite (TDRS), May 1995.

10) *501-601 Network Operations Support Plan for the Space Shuttle Program*, December 1993.

11) *530-Interface Control Document (ICD) Between The Network Control Center (NCC) - Flight Dynamics Facility (FDF) And The White Sands Complex (WSC)*, April 96.

12) *530-Interface Control Document Between The Goddard Space Flight Center Payload Operations Control Centers And The Network Control Center Data System*, March 92.

13) 543-Operations Interface Procedures Between The Goddard Space Flight Center Network Control Center And The Second TDRSS Ground Terminal, November 95.

14) Space Shuttle Tracking and Data Relay Satelite System NOSP for the Space Shuttle Revision 3, August 92.

1.4 Background for MDM Transition to IP

Nascom is currently transitioning their 4800-bit-block point-to-point network to an IP backbone. Existing 4800 bit-block services are provided by encapsulating 4800 bit-blocks in IP/ User Datagram Protocol (UDP)/ Real-time Transport Protocol(RTP) datagrams using Nascom provided conversion devices. See Reference 2) for data format descriptions. Modified Multiplexers/Demultiplexers(MDMs) will be used at White Sands Complex (WSC) and Johnson Space Center (JSC) to convert Space Network(SN) data to and from the IP infrastructure.

The modifications to the MDM equipment include the addition of a Nascom LAN Interface Card(NLIC) to each device which provides conversion of the MDM aggregate interface (4880-bit block protocol) for transmission to/from the IP infrastructure. Modified MDMs were developed by Lockheed Martin Space Information Systems (LMSIS) in accordance with the system requirements specification , Reference 4.

The modified MDMs support Simple Network Management Protocol (SNMP) Version 1 with a proprietary Management Information Base (MIB) for monitoring and control via the Network Management System (NMS). The NMS is provided by Nascom's Network Operations Center (NOC) at GSFC. Each MDM device's MIB contains IP mapping

information for routing data over the IP network. The NOC controls the MUX and DEMUX mapping information and can also control MUX UDP/IP output as well select DEMUX input from UDP/IP in conjunction with local switches. The MIB contains traffic statistics to be monitored by the NMS. In addition error traps are sent to the NMS.

Each modified MUX can transmit two data streams simultaneously: a 4880-bit-block stream sent via Domsat during transition and an IP/UDP/RTP stream for the IOnet. The user will be able to receive from either source, allowing fallback during cutover. The MUX UDP/IP data flow is selected via local hardware switch and SNMP control variable. Only one MUX of a redundant pair will be selected to put data on the IOnet. This data can be received by both DEMUXes of a redundant pair via the multicast feature of IP transition.

Each modified DEMUX includes an NLIC card which accepts UDP/IP packets from IOnet. A local switch between the NLIC and the OTUs selects between 4880 bit blocks input from Domsat or IP data from the NLIC but not both concurrently. In addition in order to flow IP data, an SNMP control variable must be set to select NLIC data. s DEMUXes can both receive the same IP data stream by having an identical mapping configuration.

The MDMs at JSC are modified for IP identically to the modifications for the WSC MDMs and thus will provide the conversion to serial lines needed for JSC users, virtually eliminating the need for PC-based CDs. The JSC MACS will remain to support the JSC MDMs but will no longer be commanded by the CSS which has already been turned down.

Figure 1-1 illustrates the transition architecture at a point when the IP infrastructure has been installed, and redundant services have been established at user sites with installed conversion devices. The main features illustrated include:

a) the coexistence of the Nascom IP network and the Common Carrier Broadcast Data Transmission System (CCBTS) Domsat links between the GSFC, WSC and JSC sites

b) the deployment of conversion devices between serial 4800-bit data and the IP backbone, both between users and TDRSS and between users and other users.

At the conclusion of all acceptance testing all MDM services will be cut over from the Domsat to IOnet. The MDMs at GSFC and MSFC will be turned down and removed as will the MACS. The DCS and DMS at GSFC will also be turned down unless there are other patched services that still need to be transitioned or moved to other equipment in Tech Control.

In many cases the CDs for MDM support were installed at the same time as those used for MSS support. This way user cutover testing at those sites can begin as soon as the MDM modifications are successfully installed The remaining CDs for MDM support will be installed into user facilities as soon as possible.

Transition Configuration

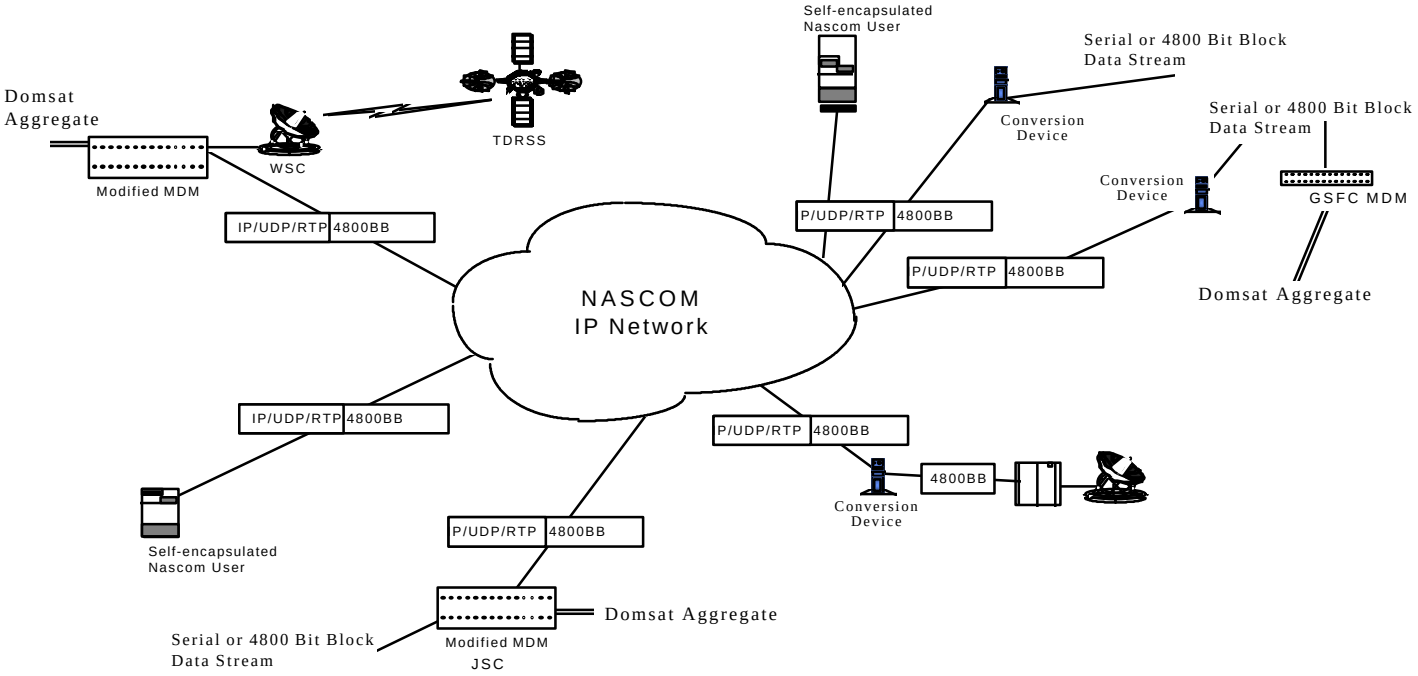

Figure 1- 1 Transition Configuration

1.5 WSC Cutover

WSC has the White Sands Ground Terminal (WSGT) and the Second TDRSS Ground Terminal (STGT) which will both be transitioned. The WSGT/STGT transition is a critical part of the IP Transition effort. Close coordination between the site personnel, MDM modification personnel, Code 530 Networks, and Code 540 Nascom personnel will be required to insure a smooth transition effort, particularly during the circuit cutovers. This transition will start when the MDMs are modified with a goal of finishing the transition by the end of October 1997.

A simplified version of the present configuration of WSGT (and STGT) is shown in Figure 1-2. Redundant output from A & B MUXes is routed via redundant Domsats to JSC & GSFC. The MUX output of the two ground terminals (STGT and WSGT) is cross-strapped (multiplexed) and then interfaced to the Domsat. There is also a 10 channel test MUX that is not pictured. WSC has redundant A and B DEMUXes for data from GSFC and JSC. A Circuit Switch/Signal Splitter selects the A or B side of the DEMUX. There is also a Line Outage Recorder (LOR) Playback/Test DEMUX that is not pictured.

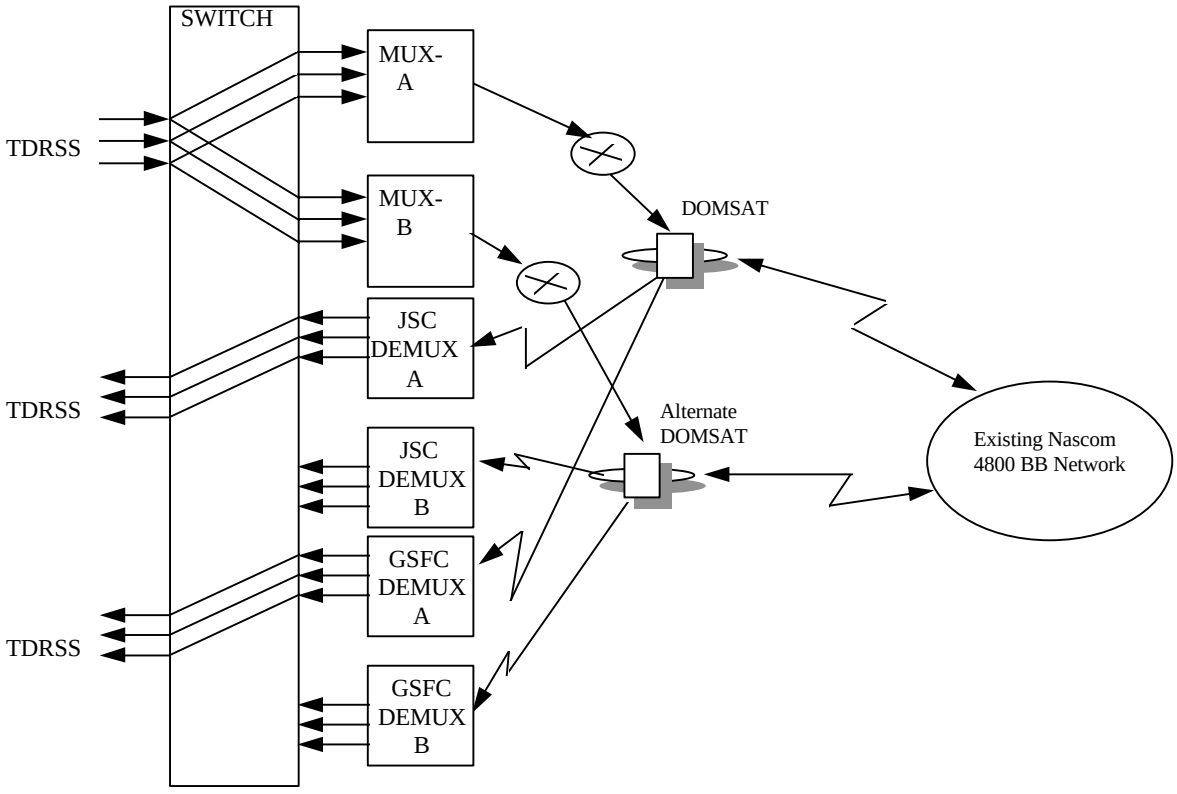

Figure 1- 2 Present Configuration at WSGT (and STGT)

The transition configuration at WSGT and STGT includes adding access to IOnet with additional FTS-2000 lines, redundant IOnet routers, and modification of the MDMs with the Nascom LAN Interface Cards (NLIC) to support the IP protocol. A simplified WSGT transition configuration is illustrated in Figure 1-3 showing interfaces between the MDMs and Domsat and the MDMs and IP infrastructure. Each ground terminal has A & B routers dual homed to two FDDI concentrators on the WSGT/STGT FDDI ring. STGT has a WAN router to GSFC dual homed to both STGT concentrators. WSGT has a WAN router to JSC dual homed to both WSGT concentrators.

The simultaneous dual output (both to Domsat and to IOnet) from each MUX will allow site by site transition of return services to IP. Each multiplexer will be modified to output an additional composite stream in UDP/IP format. For a pair of redundant MUXes, the output from one MUX can be disabled by site switch and SNMP control. No redundant output to IOnet is allowed. This is emphasized on the figures by showing one solid line and and one dashed line from a MUX pair to the IP router. The user will be able to receive from either Domsat or IP source, in case fallback is required during cutover.

A DEMUX pair, A & B, may be split with one DEMUX receiving 4880-bit-blocks via Domsat and the other DEMUX receiving IP packets . A single DEMUX cannot receive both Domsat and IP concurrently. However, both A & B DEMUXes may receive IP as will be the case in the final configuration. Testing will be supported from the WSC ground terminals such that impacts to SN Operations is minimized (e.g., test with ground terminal supporting TDRS Spare).

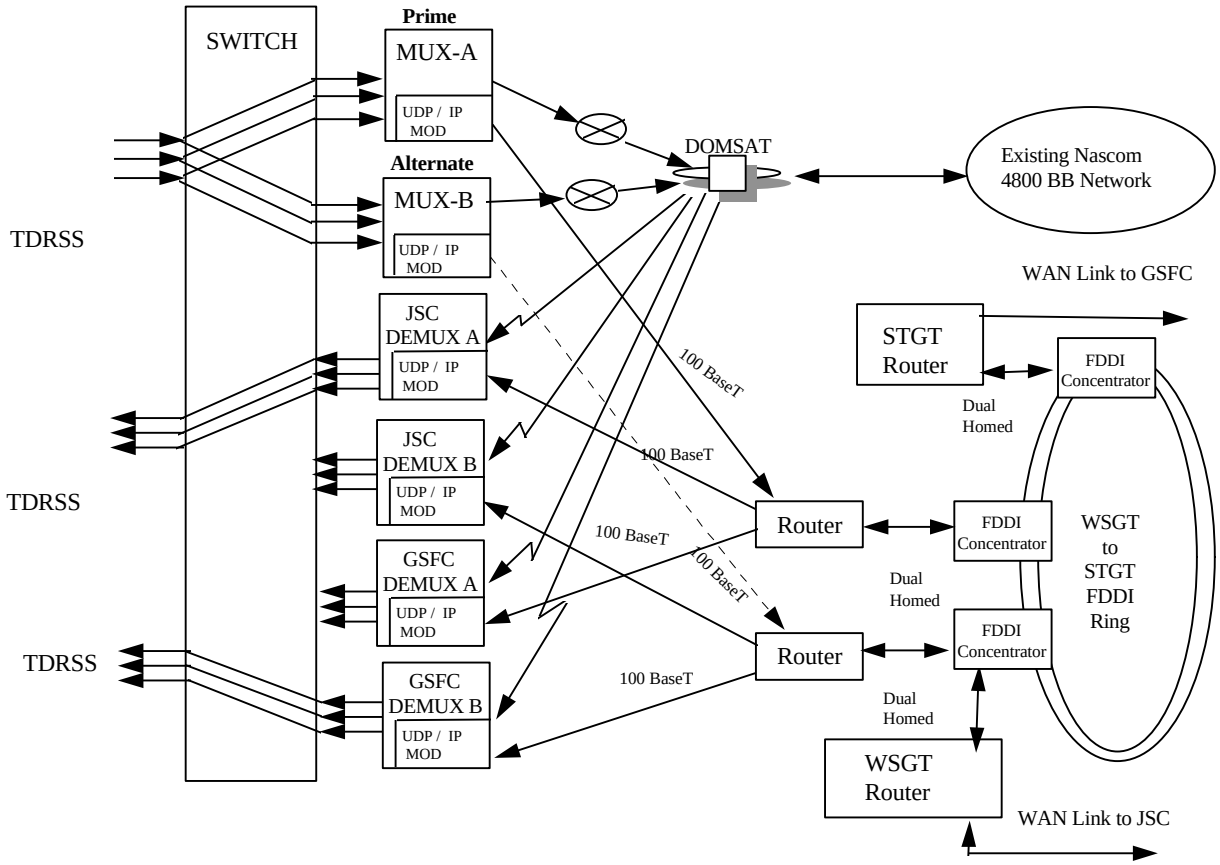

Figure 1- 3 WSGT During Transition

The modifications to WSGT and STGT MDMs will occur in the same time frame (i.e. only one trip is planned for all of the installations at WSC). The modifications to the JSC MDMs will occur before the WSC devices are modified.

When all user interfaces have been tested satisfactorily, all of the DEMUXes at WSC will be switched to UDP/IP. After a period of acceptance, but no later than January 1, 1998 the Domsat service between sites will be deactivated and the MDMs at GSFC will be deactivated. Figure 1- 4 shows this configuration at WSC.

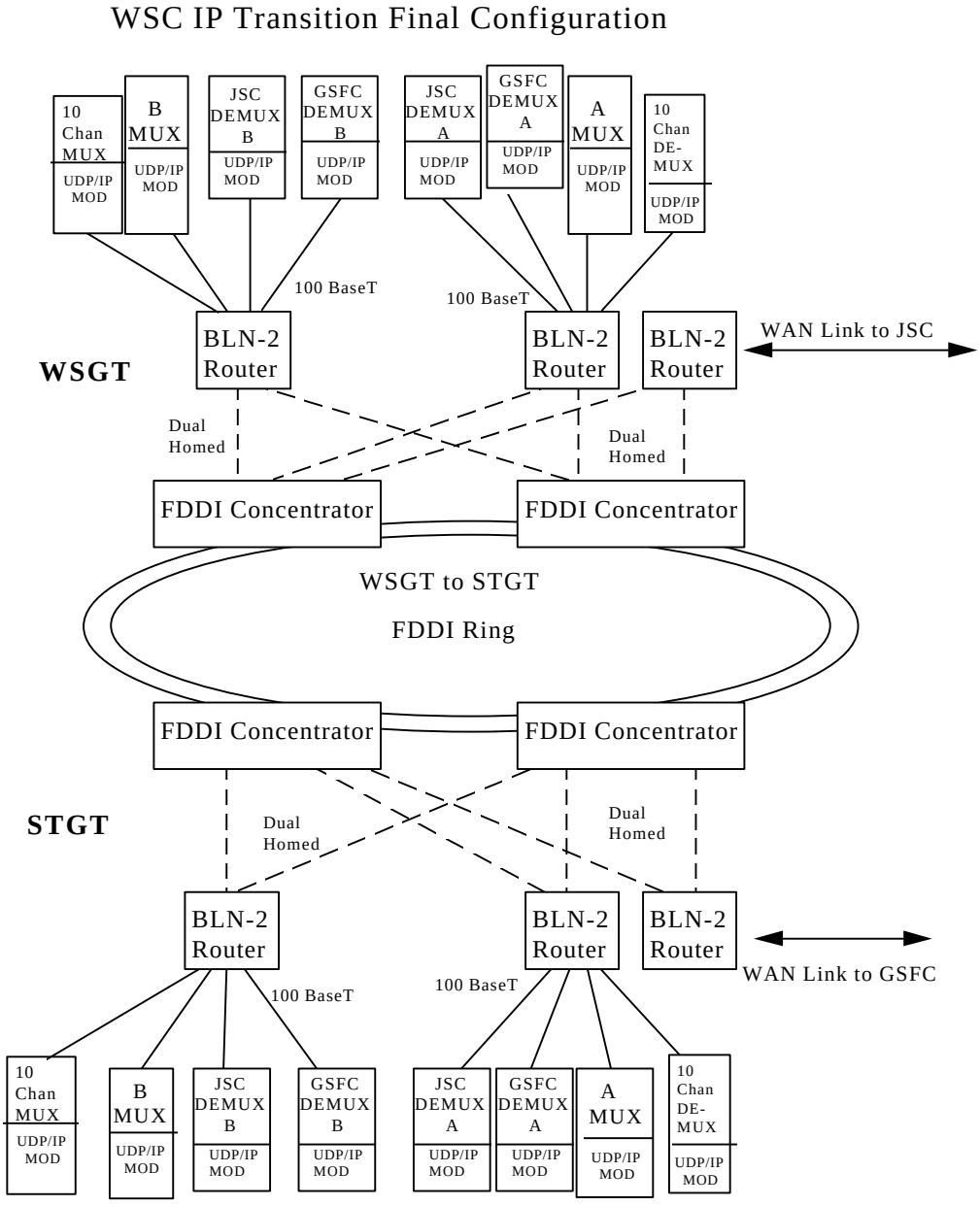

Figure 1- 4 Final Configuration at WSC

1.6 JSC Cutover

The modified MDMs at JSC will be tested during the same time period that the MDMs at WSC are being tested. The transition configuration at JSC is very similar to WSC except the interfaces are between JSC users and Domsat or JSC users and IOnet. The restrictions discussed for WSC also apply to JSC. Redundant output to the IP is not allowed. Simultaneous output to Domsat and IOnet is provided by the modified MUXes.

The modified DEMUXes can receive either Domsat output or IOnet output, but not both at the same time. Figure 1-5 shows the transition configuration at JSC.

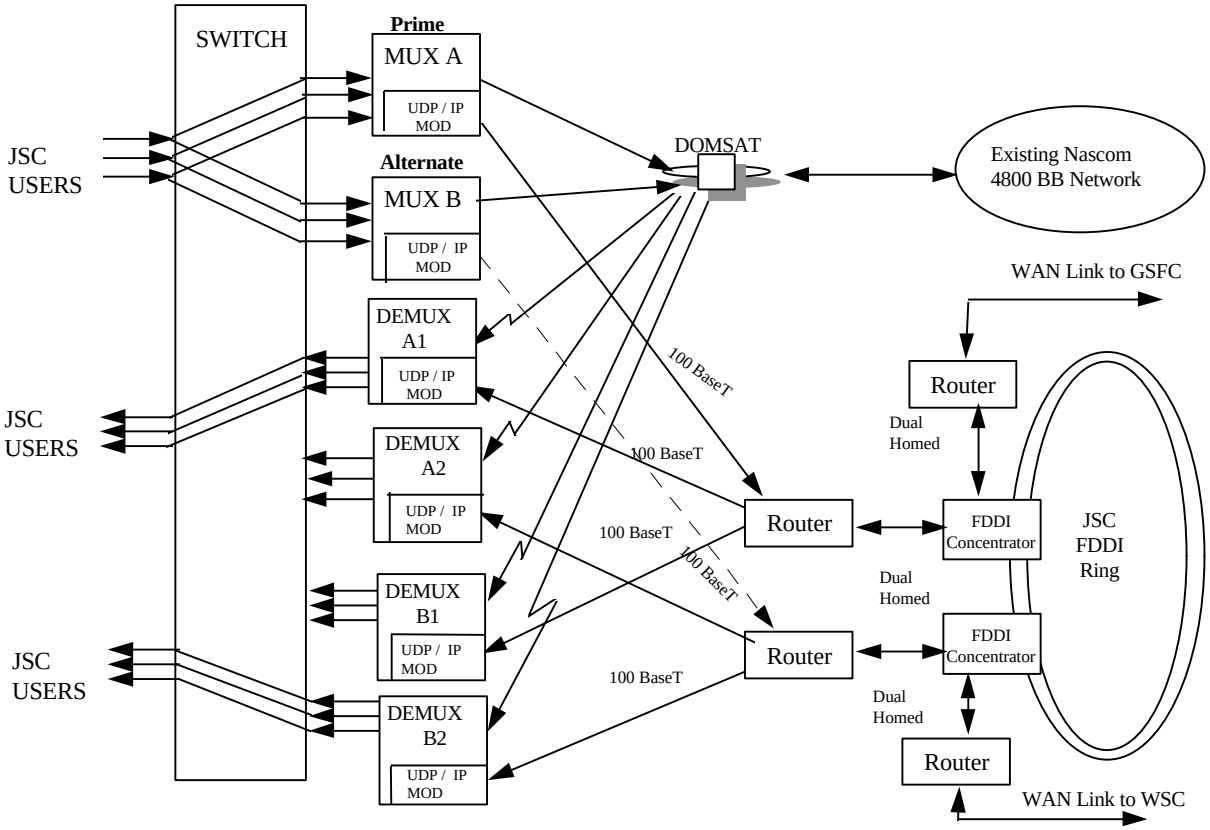

Figure 1- 5 JSC Transition Configuration

When all user interfaces have been tested satisfactorily, all of the DEMUXes at JSC will be switched to UDP/IP. Figure 1- 6 shows the final configuration at JSC.

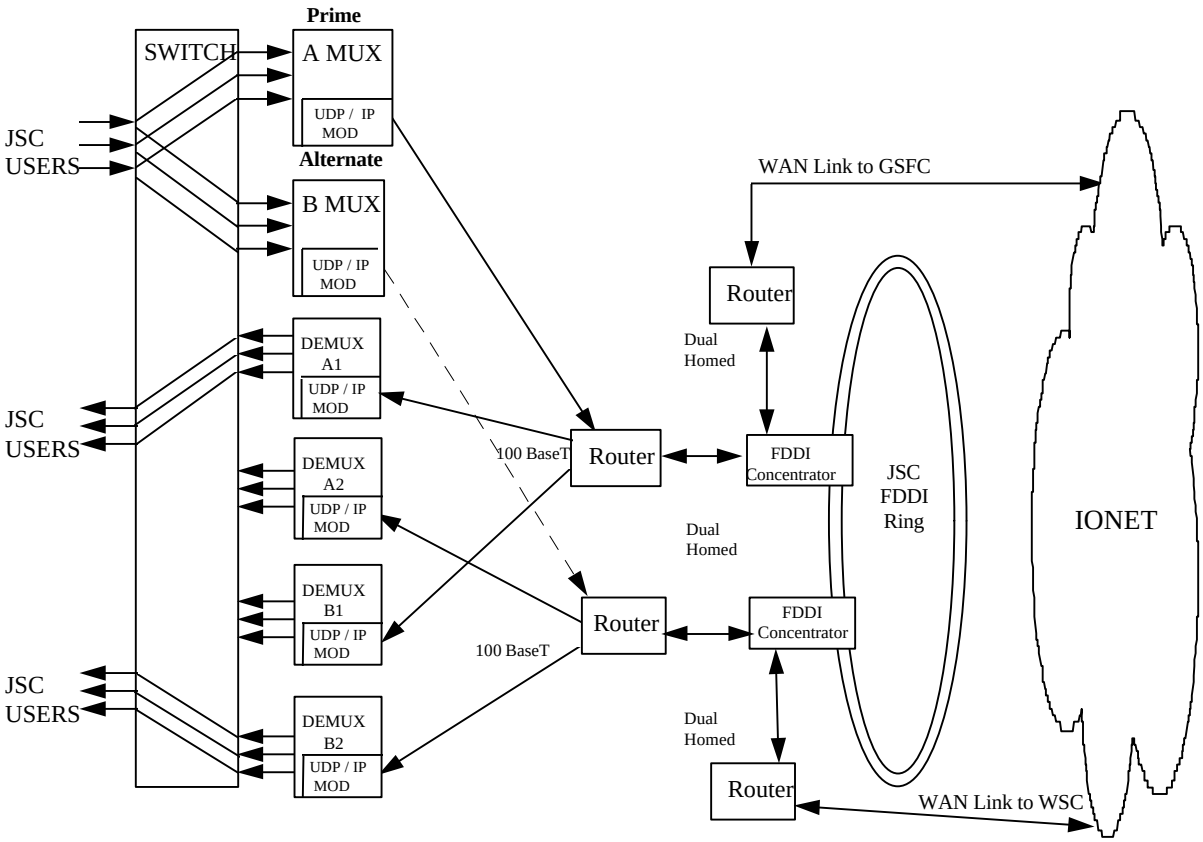

Figure 1- 6 JSC Final IP Configuration

1.7 Test Reporting and Evaluation

Participating elements will be required to provide test activity reports which will include evaluation of objectives along with reporting of any anomalies experienced during testing. Anomalies will be tracked with trouble reports. Results will be evaluated to determine if tests need to be repeated and whether subsequent tests can proceed. Test procedures in the following sections will provide any dependencies on previous tests which must be satisfied before they can proceed.

2. Factory Acceptance Test (FAT)

2.1 Description

The FAT will be performed to verify that the NLICs perform as specified. Detailed procedures are provided in the LMSIS document *Nascom IP Transition Project MDM Modifications Acceptance Test Procedures* as are the test requirements, test equipment, approval criteria, and dependencies.

Test devices include a MUX, a DEMUX, Bit Error Rate Test Set (BERTS) at sender and receiver, hub, network analyzer, BLN router, SNMP manager PC, MDM Local Control & Monitor (LCM) PC, a SCD and a PTP.

Testing is divided into 4 subtests:

1. The *Bootup and Initialization* test of the NLIC equipment will power up the NLIC to verify operability and initialization of the NLIC IP address and routing tables.
2. The *SNMP Agent Control Verification* will validate the ability of the SNMP Agent resident within the NLIC firmware to configure the Multiplexer and the Demultiplexer NLIC equipment.
3. The *Standalone Data Flow Verification* will validate the ability of the SNMP Agent to capture data flow statistics and trap errors.
4. The *Multicast & SCD/PTP Compatibility* testing will validate NLIC support of Class D multicasting in dataflows with the SCD and PTP.

2.2 Test Management/Coordination

The FAT is managed and conducted by LMSIS, at LMSIS facilities and will be supported by Nascom personnel. It is currently scheduled for May 19 through 23. The Error Condition tests that are part of the Non-User Testing (FAT, Site Qualification, NLIC Integration Testing) will be documented.

3. NLIC Integration into IP Network

3.1 Installation of NLICs and Site Qualification Tests

LMSIS will install the Nascom LAN Interface Cards (NLICs) first into JSC MDMs and then into WSC MDMs. They will verify the NLIC integration into the MDMs as described in their *Nascom IP Transition Project MDM Modifications Qualification Test Procedure*, SQ49563, March, 1997. This testing will be local.

As described in Section 3, page 9, of SQ49563, above, the MDM equipment will be modified and tested in groups, each including a MUX and one or two DEMUXes. At the completion of the LMSIS tests on a group, Nascom will then test the integration of those devices into the IOnet as described in Section 3.2.

Before the devices in each group are released back to operations, the legacy aggregate interfaces for DOMSAT will be verified in each modified device.

3.2 Tests for Integration of Modified MDM Devices to IOnet

3.2.1 General

This section describes the testing that will be done to verify the integration of a group of modified MDM devices into the IP Operations Network (IOnet) after the installation of the NLICs and the successful completion of the Site Qualification Tests(QT) for that group at JSC and WSC. The first tests will be to verify the IP interface of the NOC with the modified MDM devices using Simple Network Management Protocol (SNMP) for the control and monitoring of the device MIB tables containing mapping tables, configuration parameters, and traffic statistics. Test conversion devices at GSFC will be used to receive data from the modified MDM devices and transmit data to the modified MDM devices over the IOnet. These tests will not start until the successful completion of the site Qualification Test Procedures for each set of devices at a site to be tested together.

3.2.1.1 Common Participants

The following participants will be common to all test cases:

a) Network Operations Center (NOC) - to set MDM mapping tables (unless a local SNMP manager is available) and monitor tests (Note: community strings will have to be loaded into NLIC before NOC can set MDM mapping tables into the MIBs.)

b) Conversion Device Management (CDM) - to coordinate and monitor tests

c) Nascom IP System Test Group (STG) - to provide mapping information and configure test CDs and verify results

Additional participants are listed under each test case.

3.2.1.2 Test Cases

The following IP interface verification tests will be performed at each site (JSC/WSC) for each group of MDM devices modified and integrated into IOnet:

a) SNMP data flow between modified MDM group and GSFC NOC

b) Data flow between modified MDM group and GSFC test CDs

After the above tests are completed for every group of MDM devices being modified, the IP interface between WSC MDMs and JSC MDMs will be tested.

3.2.1.3 Context Diagram

The IP transition infrastructures at WSC and JSC are illustrated in Figures 1-3 and 1-5. Figure 3-1 illustrates the IP elements at GSFC that will be involved in the testing.

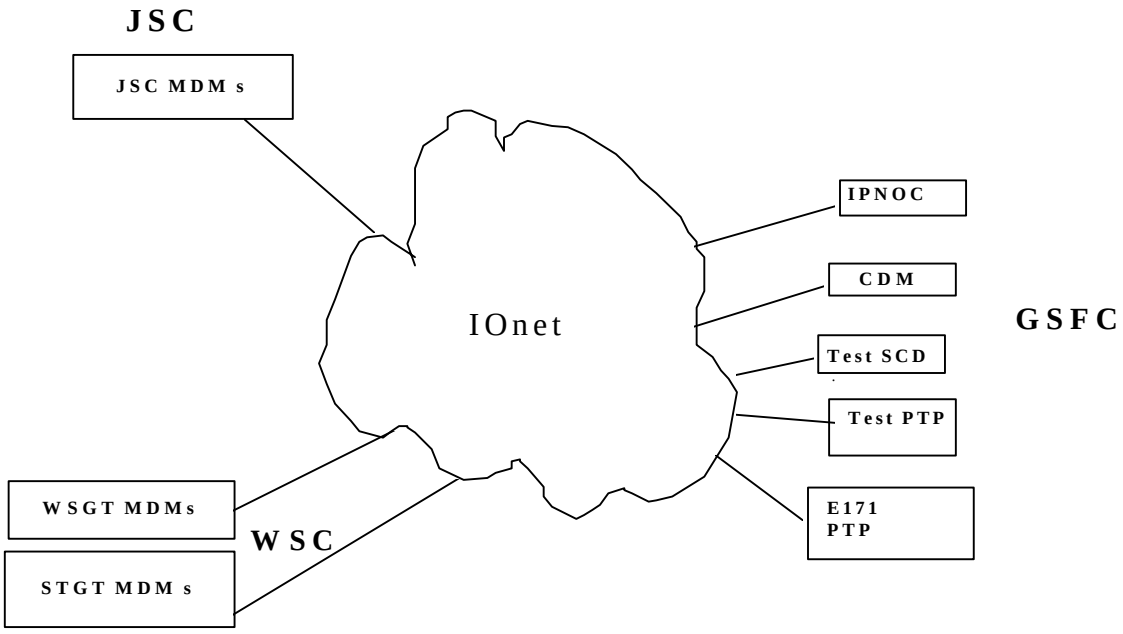

Figure 3-1 Site Context Diagram

3.2.1.5 Data Generation Methods

BERTS equipment can be used to generate data into MUX ITUs. The ITU test enable feature can also be used to generate data. Test data can be generated from both the PTP and the SCD at selectable data rates ranging from 9.6 kbps to 1.544 Mbps.

3.2.1.5 Verification Methods

It will be verified that all of data sent is received error free. Data generated by a BERTS is verified at a receiver BERTS. Data flow into the DEMUXes will be verified with MIB counts. Data flow in and out of the test CDs will be verified with status screen counts. Data flow out of the MUXes will be verified with MIB counts. Counts will be compared to verify that all data sent was received. The MDM test enable feature will be used to verify some MDM to MDM data flows.

3.2.2 Verify NOC SNMP interface to Modified MDM Device

Before the NOC testing can begin, the required community strings and IP addresses will be loaded into the NLIC of each modified MDM device to be controlled. A custom read/write community string will allow each site to control the enabling of MUX output and selection of DEMUX IP input. The NOC will have a different read/write community string for the control of mapping information.

3.2.2.1 Purpose

The purpose of this test is to verify the NOC SNMP interface to Modified MDM Devices.

Test objectives include the following:

a) Verify that the NOC can set/view the MUX mapping table in the MIB of each modified MUX device.
b) Verify that the NOC can set/view the DEMUX mapping table in the MIB of each modified DEMUX device.
c) Verify that NOC can set/view the MUX parameter for enabling MUX IP data flow
d) Verify that NOC can set/view the DEMUX parameter for selecting IP input
e) Verify the NOC can view/clear traffic statistic variables.
f) Verify the NOC can receive traps from each modified device.

3.2.2.2 Description

Nascom test participants on the site of modified MDMs being tested will set community strings and IP addresses into NLIC as part of the QT. NOC personnel will use HP OpenView at GSFC NOC in conjunction with any other tools available to set and view MIB variables. Nascom IP Team will provide mapping information needed for the following tests. Verification of traps will be done during or after the following data flow tests.

3.2.3 Data Flow Tests between Modified MDMs and GSFC Test CDs

3.2.3.1 Purpose

The purpose of this testing is to verify the integration of modified MDMs into the IP infrastructure between the site and GSFC test conversion devices.

Objectives:

a) Verify data flow from ITUs in a modified MUX through the NLIC over the IOnet to GSFC test conversion devices (CDs) at various data rates.

b) Verify data flow from GSFC test CDs over IOnet to modified DEMUXes at various data rates.

3.2.3.2 Participants

a) NOC

b) CDM

c) Nascom IP Team Participants and STG

d) Site Operations Personnel

3.2.3.3 Test Configuration

A group of modified devices including 1 MUX and 1 or 2 DEMUXes will be chosen for the testing between the site (JSC, WSGT, and STGT) and GSFC. The NLICs will be configured to send traps to the NOC. The NOC will configure the test mapping information into the NLIC MIBs being tested. A BERTS will be required at the MUX for generating data into an ITU configured for the test. A BERTS will be required on a serial circuit from a test PTP at GSFC for evaluating the data flow. A SCD cannot be used for the unblocked data flow to the BERT. The data flow between a modified MUX and GSFC test CDs is shown in Figure 3-2.

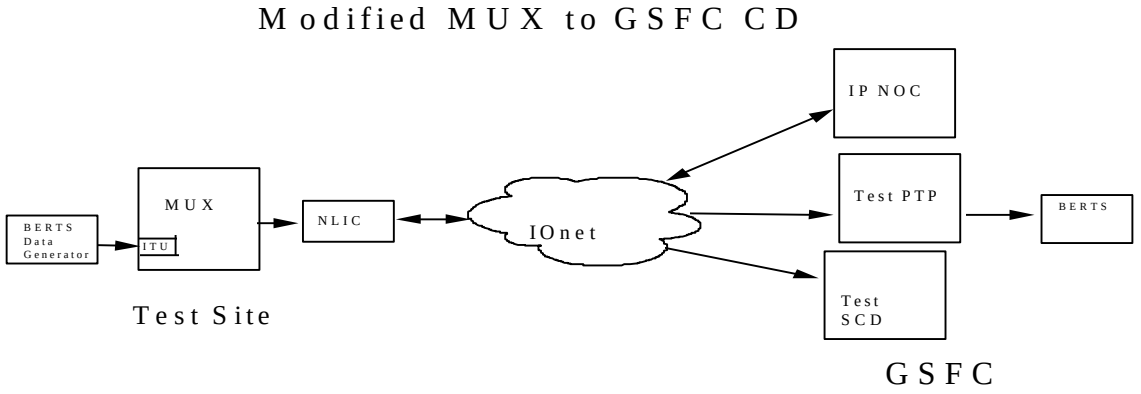

Figure 3- 2 Modified MUX to GSFC CD

Data flow from a GSFC CD to a Modified DEMUX is shown in Figure 3-3. This data flow may optionally include BERTS data generated from GSFC into a PTP.

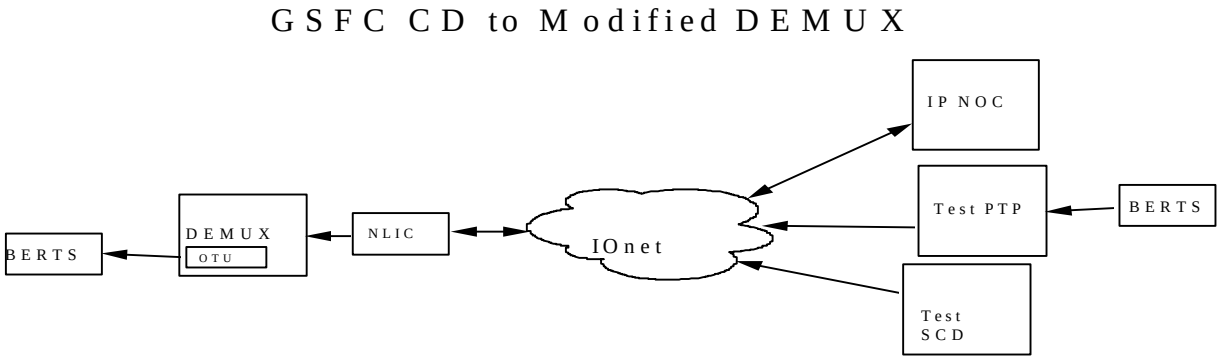

Figure 3- 3 GSFC Test CD to Modified DEMUX

3.2.3.4 Test Description

This set of tests will be done for a group of MDM devices at each site. The NOC will set test mapping information into MIBs of test devices. The NOC will verify MIB parameters for MUX IP data flow and DEMUX select IP input. Data flow will be generated into the modified MUX for transmission through the IP Infrastructure to test CDs at GSFC and looped back to test DEMUXes. Data will also be generated at test CDs at GSFC for receipt by DEMUXes at the site. A detailed script (Appendix G) created by STG will be followed for tests run by STG. Tests will be repeated to include variable data rates, durations, and additional ITUs and OTUs.

3.2.3.5 Test Scenario

- Configuration

  a) Have NOC configure the MUX mapping table to include the test ITU LPAs with the test destination multicast addresses and UDP ports to which the test CDs will be listening.

  b) Have NOC configure the DEMUX mapping table to receive data for the test multicast address, UDP port, and source address information from the test CDs.

  c) Have NOC verify correct mapping information and configuration settings for mdmDataFlow and mdmDemuxInSelect.

  d) Configure the test CD(s) to listen for the MUX multicast address and UDP port for the LPA with the correct MDM data flow parameters.

  e) Configure OTU(s) and modified DEMUXes to listen for the same dataflow.

  f) Configure a test CD to generate MDM data flow with the correct MDM data flow parameters for the DEMUX multicast address and UDP port for a test OTU.

- MUX to GSFC test CD data flow

  a) Generate data into the test ITU at the modified MUX.

  b) Verify data flow through the MUX and NLIC at the LCM and MIB view.

  c) Verify data receipt at the GSFC test CDs.

  d) Verify data receipt at BERTS connected to site OTU(s) [LCM, MACS if at JSC].

  e) Verify BERTS data at a BERTS in Tech Control to which the PTP receiving the data has been patched.

  f) Compare sent/received counts and record any RTP sequence errors or BERTS errors.

- GSFC test CD to modified DEMUX(es) data flow

a) Generate data from a test CD at GSFC - may also be a loopback from a MUX data flow.

b) Verify data flow from the CD into both modified DEMUXes in test group by MIB counts.

c) Verify BERTS data flow in a BERTS attached to the OTU(s) receiving data.

d) Verify data received count is same as data sent count. Record any RTP sequence errors and BERTS errors if applicable.

- Repeat tests for different data rates, durations, additional ITUs and OTUs.

3.2.4 Data Flow Tests between WSC MDMs and JSC MDMs

3.2.4.1 Purpose

The purpose of this testing is to verify the IP interface between WSC MDMs and JSC MDMs.

Objectives:

a) Verify data flow from an ITU in a JSC MUX through the NLIC and IP Infrastructure to a JSC DEMUX at WSC.

b) Verify data flow from an ITU in a WSC MUX through the NLIC and IP Infrastructure to a JSC DEMUX.

3.2.4.2 Participants

a) NOC

b) CDM

c) Nascom IP Team

d) JSC Operations

e) WSC Operations

3.2.4.3 Test Configuration

The data flow from a JSC MUX to a JSC DEMUX at WSC and a test CD at GSFC is illustrated in Figure 3-4.

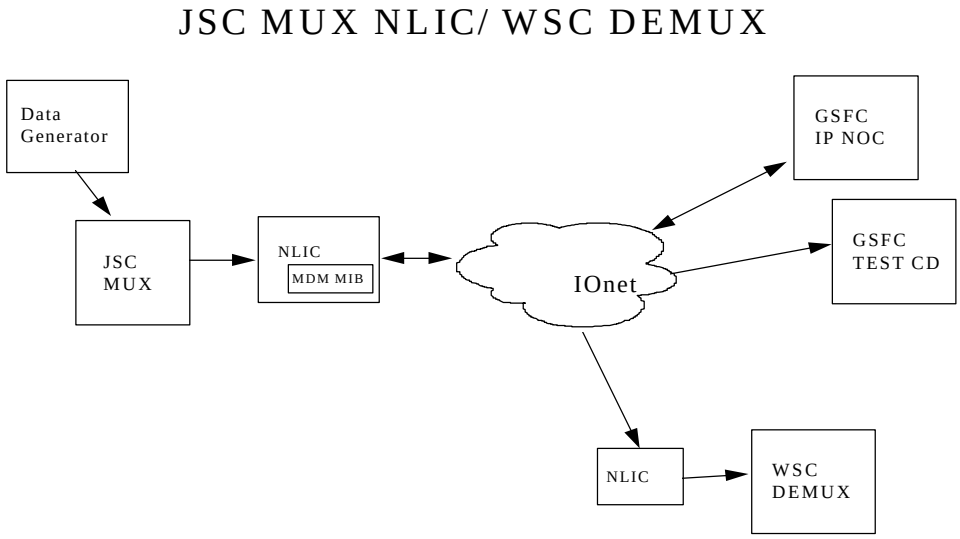

Figure 3- 4 JSC MUX to WSC DEMUX and Test CD at GSFC

The data flow from a WSC MUX to a WSC DEMUX at JSC is illustrated in Figure 3-5.

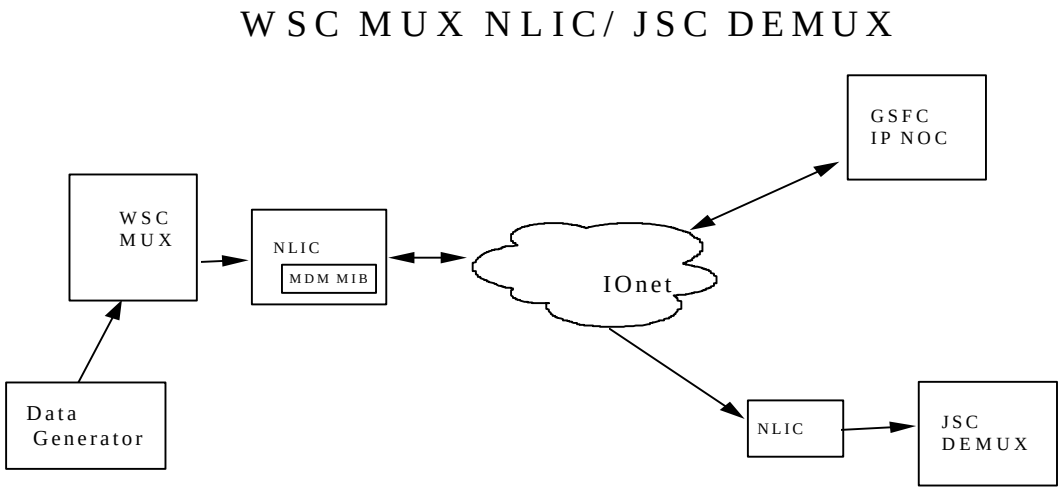

Figure 3- 5 WSC MUX to JSC DEMUX

3.2.4.4 Test Description

Mapping tables will be configured for the testing addresses. Data flow will be generated into a JSC MUX for transmission through the IP Infrastructure to a JSC DEMUX at WSC. Data flow will be generated into a WSC MUX for transmission through the IP Infrastructure to WSC DEMUX at JSC. BERTS generated data will be verified in BERTS. All tests will be performed between JSC and each ground terminal (WSGT and then repeated for STGT).

The data should also be checked locally if it wasn't received at the remote DEMUX (to isolate where the problem occurred).

3.2.4.5 Test Scenario

- Configuration
  a) Have NOC configure the MUX mapping table to include the test ITU LPAs with the test destination multicast addresses and UDP ports to which the DEMUXes will be listening.
  b) Have NOC configure the DEMUX mapping table to receive data for the test multicast address and UDP port from the MUX ITU.
  c) Have NOC verify correct mapping information and configuration settings for MUX IP data flow (mdmDataFlow) and mdmDemuxInSelect.
  d) Configure the test CD(s) to listen for the multicast addresses and UDP ports with the correct MDM data flow parameters.
  e) Configure NLICs in test to send traps to NOC.
- JSC MUX to WSGT's JSC DEMUX and GSFC test CD data flow
  a) Configure one of WSGT JSC DEMUXes for IP
  b) Generate data into the test ITU at the JSC MUX
  c) Verify data flow through the MUX and NLIC at the LCM and MIB view
  d) Verify data receipt at the WSGT JSC DEMUX configured for IP
  e) Verify data receipt at the GSFC test CDs
  f) Repeat test from alternate JSC MUX and for alternate WSGT JSC DEMUX
- WSGT MUX to JSC WSC DEMUX
  a) Configure JSC WSC DEMUX for IP
  b) Generate data into the test ITU at a WSGT MUX
  c) Verify data flow through the MUX and NLIC at the LCM and MIB view

d) Verify data receipt at the JSC WSC DEMUX configured to IP

e) Repeat test from alternate WSGT MUX and for alternate JSC WSC DEMUX

- Repeat all of the above tests for STGT with JSC

4. Space Network(SN) MDM/IP Transition Test Procedures

4.1 Description

In this section, high level objectives are stated with respect to the SN. Code 541 and 532.2 will provide test planning, and support coordination of test elements. Supporting element requirements are defined. Test scheduling requirements and test results reporting and evaluation are discussed. Space Network MDM/IP transition test plan procedures described in subsequent sections were developed to be tested progressively and are designed to build upon the successful completion of the previous test. The culmination of these tests, when completed, will result in the cutover from the Domsat communication link to the IOnet.

4.2 Test Objectives

The high level objectives of the Space Network MDM/IP transition testing are as follows:

a. Verify IP transition interfaces between User/POCCs and modified multiplexer and demultiplexer systems at WSC and JSC via the user conversion devices (CDs) through the IOnet.

b. Verify full period interface services between GSFC, JSC, and WSC utilizing the WSC/JSC modified MUX/DEMUX systems through the IOnet

c. Verify TDRSS customer forward (command) services through the IOnet.

d. Verify TDRSS customer return (telemetry) services through the IOnet.

e. Verify JSC customer requirements through the IOnet.

4.3 Test Management/Coordination

Code 541 and 532.2 will jointly provide the test planning and support coordination required for this testing along with management concurrence of WSC test managers, JSC test managers, applicable Nascom engineering, Nascom operations personnel, and customer Project teams.

4.4 Supporting Element Requirements

Various elements will be required for this testing. All elements will provide appropriate reports to management and other cognizant personnel. Support requirements are as follows:

4.4.1 POCCs

Schedule test events from user modules specifying forward, return, tracking services and logical port addresses as requested by Goddard Test Director. Transmit commands to WSC via the IP interface. Receive and score return link telemetry data for validity via the IP interface and compare with legacy MDM interface if possible. Verify that spacecraft commands are valid.

4.4.2 Nascom

Provide MUX and DEMUX mapping tables. Provide conversion device configuration. Provide technical expertise for users of the IP when troubleshooting is required. Insure all elements have conversion devices installed and working according to specifications. Devlop test plan to be used to conduct IOnet checkout testing. Complete IOnet checkout as described in Section 3 before Code 532.2 testing begins.

The IP Network Operations Center (NOC) sets configuration of MUX and DEMUX mapping tables and monitors the network infrastructure including IP routers and FDDI ring and hub configurations during test activities.

Conversion Device Management (CDM) provides configuration of conversion devices, test coordination, and monitoring.

4.4.3 NCC

Coordinate scheduling of test events with POCCs, develop test plan to be used to conduct test, prepare briefing messages for test events, and provide fault isolation coordination with SN elements. Conduct or participate in relevant meetings and teleconferences.

4.4.4 WSC

Insure that IP and MDM configuration for transition testing is installed and properly interfaced with Low Rate Data Switch. Provide TDRS resources and station support personnel to conduct testing. Conduct or participate in relevant meetings and teleconferences.

4.4.5 JSC

Insure that IP and MDM configuration for transition testing is installed and properly interfaced with Consolidated Data Select Switch (CDSS). Verify the viability of the

modified MDMs and the IOnet by performing Space Shuttle Orbiter (SSO) tests via the Space Network, Ground Network, Deep Space Network and Remote Tracking Sites. JSC/ESTL (Electronic Systems Test Laboratory) will emulate- the Orbiter's avionics for SN testing. Schedule test events, transmit commands and score SSO telemetry and tracking data for validity.

4.4.6 SOC

Simulate user's spacecraft prior to full POCC participation by transmitting commands and return link telemetry data to WSC via the RFSOC and the IP and legacy MDM network. The SOC/RFSOC will be used to validate IOnet configuration from the user to spacecraft and back to the user. A successful test with the SOC via the IOnet is expected prior to moving to the next phase of testing with the users.

4.4.7 RFSOC

Provides the RF (Radio Frequency) source to emulate user spacecraft configuration. The RFSOC will insure that their system is configured to receive forward link commands and transmit return link telemetry data via TDRS back to the SOC via WSGT, the legacy MDM and the Ionet.

4.4.8 SDPF

SDPF provides telemetry and image data processing services for wide variety of manned and unmanned space missions. SDPF will receive and monitor telemetry data for POCCs and Principal Investigators (PI) coming from the legacy MDM and the IOnet simultaneously. SDPF will verify that the data via the IOnet is valid.

4.4.9 FDF

The Flight Dynamics Facility (FDF) will receive tracking data from WSC via the IOnet for use in the orbit determination of customer spacecraft. FDF will be responsible for monitoring and validating customer tracking data from WSC.

4.5 Test Scheduling Requirements

4.5.1 General

After successful completion of the NLIC integration into the IOnet, the following tests will be conducted to allow for non-intrusive operational impact to on-going customer network support requirements. As a prerequisite to these tests, customers must have CD devices installed and operational. These tests have been developed to proceed sequentially until they are completed successfully. Testing of customer return services will begin following completion of the RFSOC/SOC Verification Test. The multiplexers will have

the capability of simultaneously supporting in the IOnet and Domsat mode. Customers will be requested to score and evaluate their telemetry data based on their established acceptance criteria.

For the purposes of these tests, SN Users will be asked to fill out "Event Description Summaries" aka modules (see User module, Appendix E). These modules when completed, will contain requested support, config codes, LPAs and other relevant information needed for testing. Each module will be used as a "test event." These modules will ensure that all the SN User LPAs contained in the Appendices will be tested.

Return link services will be verified by the *WSC SN Return Data Evaluation Tests* described in Section 6.1. The user return link data will be transmitted via the Legacy MDM and the IOnet simultaneously.

Forward link services will be verified by the *WSGT SN User Forward Link Verification Test* and *STGT SN USER IOnet Verification Test* described in Section 6.2 and 6.3 respectively. The user's tests include: a) User to WSGT, b) User to STGT . DEMUX limitations dictate that forward link testing be closely coordinated with customers on an individual basis. Following successful command interface tests with each customer at WSGT, periods will be coordinated with STGT to put the GSFC DEMUX forward interface into an IP configuration for a specified block of time each day for further testing. Customers will be requested to schedule test modules forward and return services. Customers are recommended to transmit NO OPS commands to their spacecraft to evaluate the forward command interfaces.

The *JSC Network Modified MDM and IOnet Verification Test* is described in Section 7. JSC will schedule the configuration codes used to develop test modules in Appendix H to accomplish the SN objectives for this test.

The final phase of IP testing will consist of continued use of User modules for extended blocks of time along with additional operations and activities added by test personnel to increase the number of simultaneous forward and return service activities supported by the modified MDMs at WSC/JSC. This constitutes the MDM Loading Test that is described in Section 8.

4.6 Tests Results Reporting and Evaluation

Test debriefings will be conducted following test phases to evaluate readiness to proceed with the next test phase. The SN test phases are

a) Non-User SOC/RFSOC testing
b) WSC SN Return Data Evaluation
c) WSGT SN User Forward Link Verification Test
d) STGT SN User IOnet Verification Test
e) JSC Network Modified MDM and IOnet Verification Test
f) MDM Loading Tests

Participating elements will be required to provide test activity reports which will include evaluation of objectives along with reporting of any anomalies experienced during the test period. Periodic meetings will be held to discuss
test results.

5. SOC/RFSOC Tests

5.1 Purpose

The purpose of this test is to verify that the modified MUX/DEMUX configuration at WSC and the IOnet/CD interface is viable by utilizing the Simulation Operation Center (SOC) and the Radio Frequency Simulation Operation Center (RFSOC) in an end to end test configuration to simulate a User's Payload Operations Control Center (POCC) and spacecraft operations .

Objectives:

a) Verify the simulated user's ability to transmit command data via WSGT modified DEMUX configurations and the IOnet/CD.

b) Verify the simulated user's ability to receive telemetry data via WSGT modified MUX configurations and the IOnet/CD.

c) Verify that WSGT can reconfigure the user forward link from IOnet to Domsat. This will illustrate that WSGT can normalize the MDM configuration if needed for SN Operations.

d) Verify the validity of simulated user's tracking data messages (TDMs) via the IOnet.

5.2 Participants

a) RFSOC/SOC

b) NCC

c) WSGT

d) FDF

e) Nascom (CDM and NOC)

5.3 Test Configuration

a) The configuration for this test is shown in Figure 5-1

b) TDRS Spare at WSGT will be used for this test.

c) RFSOC/SOC data flow block diagram is shown is Figure 5-2.

5.4 Test Description

RFSOC/SOC will be used to simulate a SN User's spacecraft and Payload Operation Control Center (POCC) in an SN End-To-End test configuration to validate the MUX/DEMUX modifications at WSGT and the IOnet. NCC will schedule TDRS events to ensure that mapping of the MUX/DEMUX can be verified utilizing simulated user command and telemetry. Tracking data will be sent to the Flight Dynamics Facility (FDF) for processing.

5.5 Test Scenario

- Configuration

  a) The first thing that will be verified will be the WSGT ability to switch their GSFC DEMUX from the Domsat to the IOnet for the forward link.

  b) RFSOC will participate in a calibration event to verify antenna alignment and RF signal adjustments and measurements.

  c) Nascom will provide configuration of DEMUX mapping table. NOC will set DEMUX mapping information into DEMUX. CDM will provide configuration of conversion device IP connections for SOC at GSFC.

- **Return Link**

  a) RFSOC will generate and transmit to WSGT the return link BER test data utilizing a 615 BERT test set with a 2^{11} /2047 bit pattern.

  b) Data rates of 32kbps and 512kbps will be transmitted on the I and Q channel. The Q channel will also be tested for a max rate of 1 mbps.

  c) The Goddard Test Director (GTD) will transmit Ground Control Message Request (GCMR) to WSGT to reconfigure data rates as required.

  d) The test data will make a full loop, originating from the RFSOC/SOC, up-linked to TDRS Spare, down-linked to WSGT. WSGT will acknowledge Integrated Receiver (IR) lock of the data generated by RFSOC/SOC. RFSOC/SOC will verify that the data is being transmitted back to the RFSOC/SOC via IOnet and Domsat networks simultaneously.

e) RFSOC/SOC will perform a bit by bit comparison of the data upon its return trip from WSGT.

f) Evaluation/Criteria - the data should exhibit zero errors upon its return trip to the RFSOC/SOC for approximately 15 minutes.

- **Forward Link**

a) SOC will generate and transmit 4800 bit block BER test data to WSC via a 615 BERT test set with a 2^{11}/2047 bit pattern.

b) BERTS data will be simulcast to WSGT via UDP/IP interface and the Domsat interface via the ICLU patch panel at the SOC.

c) The SOC will generate forward link data rates of 125bps and 1000bps.

d) Data will be transmitted from the SOC's IOnet/CD and Domsat interface to WSGT, up-linked to TDRSS, down-linked to RFSOC and sent to the SOC for a bit by bit comparison. (Figure 5-2)

e) Evaluation/Criteria - the data should exhibit zero errors for approximately 15 minutes.

- **Reconfiguration**

a) WSGT will reconfigure the GSFC DEMUX back to the Domsat.

b) The total time needed to do these reconfigurations will be examined.

c) The start time will be begin when direction is given by the GTD to reconfigure the support and the end time will be determined when blocks are observed via the DEMUX's Domsat interface.

d) Part (a) of the Forward Link scenario will be repeated and verified to validate that the reconfiguration was successful.

5.6 Requirements

- **WSGT**

The GSFC/JSC MUXs at WSGT will be configured to transmit via IOnet and Domsat simultaneously. The GSFC DEMUXes at WSGT will be configured via the LRDS to support Domsat on the A DEMUX and IOnet on the B DEMUX.

This will require that the GSFC alternate Domsat receive to the LRDS be reconfigured to the IOnet input at the Circuit Switch/Signal Splitter.

- **RFSOC/SOC**

  RFSOC will provide S-band Single Access (SSA) return RF to TDRS. SOC will provide simulated user forward command data. Prior to the test events a calibration Schedule Order (SHO) will be conducted to perform RFSOC TDRSS antenna alignment and RF signal adjustments and measurements.

- **FDF**

  The Network Tracking Service Group will analyze simulated User tracking data via the IOnet for data integrity.

- **Nascom**

  Nascom will monitor and assist in the configuration of IP Conversion Devices and MDMs. If problems occur in the IOnet the Communication Manager will contact the appropriate contractual personnel for assistance in troubleshooting.

- **NCC**

  The Network Control Center (NCC) will schedule SHOs for this test referencing the RFSOC/SOC test module, monitor test events, provide troubleshooting assistance and manage and control space network (SN) resources. A GTD will be on console for the test.

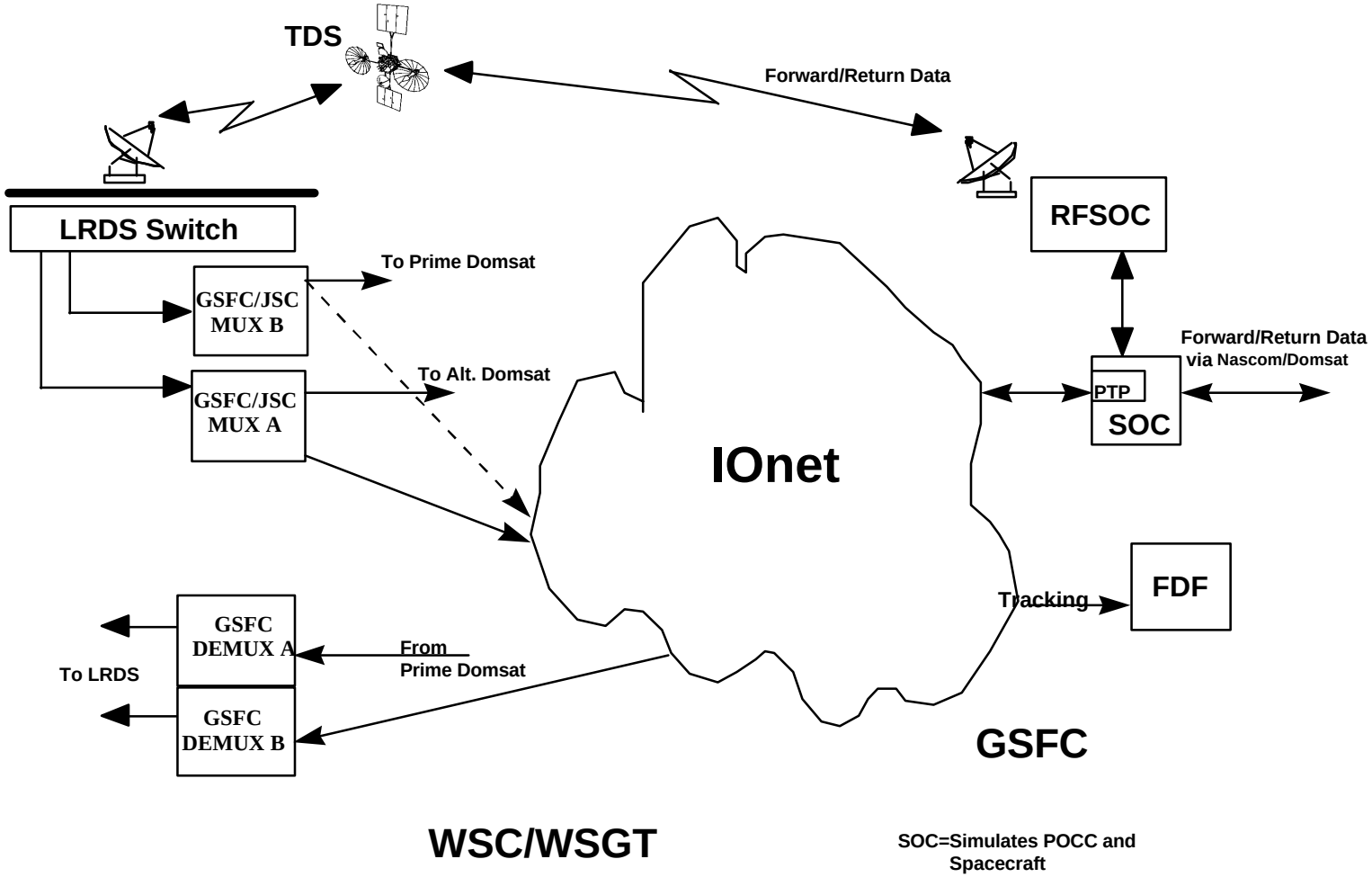

Figure 5-1 SIMULATED USER (SOC/RFSOC)

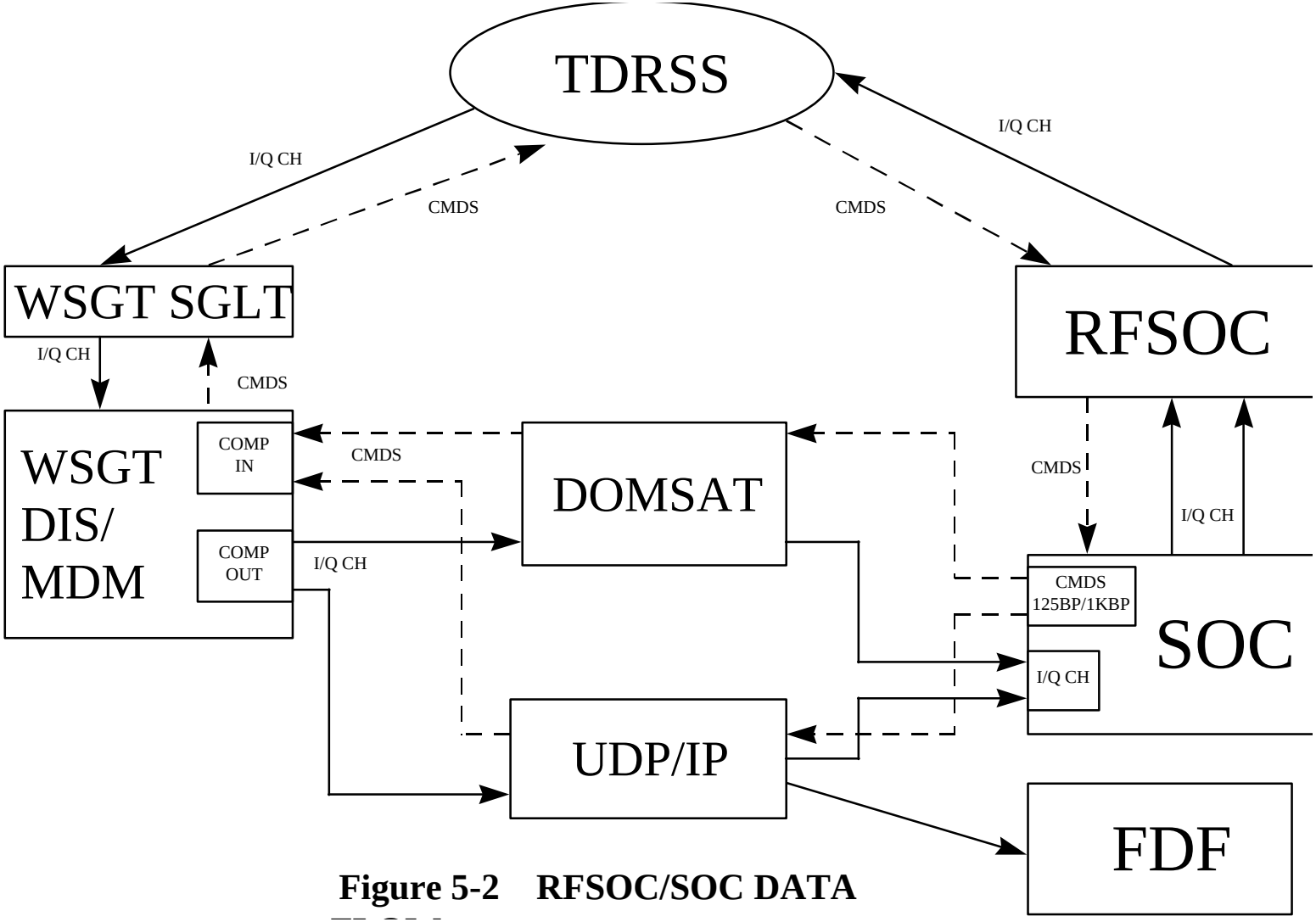

Figure 5-2 RFSOC/SOC DATA

6. WSC SN User Testing

6.1 WSC SN Return Data Evaluation

6.1.1 Purpose

The purpose of this test is to verify that the GSFC/JSC MUXs at WSC can support User return link telemetry data via IOnet/CD. All MUX transmit service requirements, as documented in the Appendices A, C and User Modules in Appendix H will be verified using the procedures describe in this section.

Objectives:

a) Verify that the modified MUXes properly map all Logical Port Addresses (LPAs), and that the user's CDs are correctly mapped and configured to the IOnet.

b) Verify that each LPA data stream transmitted by the modified MUX at WSC is received without error by the correct circuit via IOnet/CD.

c) Verify that user CDs are configured correctly for each serial circuit to process encapsulated telemetry data on the return link from IP/UDP/RTP packet format to the format required by the user.

d) Verify the validity of full period circuits.

6.1.2 Participants

a) User POCC(s): Refer to Appendices A, C, and H.

b) NCC

c) WSC

d) Nascom

e) FDF

f) SDPF

6.1.3 Test Configuration

The configuration for this test is shown in Figure 6-1. TDRS West (TDW), TDRS East (TDE) and TDRS Spare (TDS) will be used for this phase of testing.

6.1.4 Test Description

Users will receive telemetry from the ground terminal that is supporting the TDRS they schedule via the IOnet/CD and modified MUX in addition to the Domsat link. full period circuits in the above appendices will also be verified.

6.1.5 Test Scenario (User Return Link)

a) Users will schedule all return link LPAs listed in Appendices A, C, and H of this document.

b) User will acknowledge receipt of telemetry via the IOnet/CD and Domsat links and advise GTD of data quality.

c) User will transmit GCMRs for return link data rate and mode changes as required.

d) Evaluation Criteria - Receipt of valid telemetry data at the POCC via the IOnet/CD and the Domsat links.

6.1.6 Requirements

- **User POCC (s)**

  Users will schedule test modules to ensure they receive data via all possible LPAs. Prior to the start of this phase of testing, the user will coordinate with the GTD to determine when they will score the data, for how long, and the pass/fail criteria. Users will be requested to schedule playbacks to verify playback circuits.

- **NCC**

  The GTD will coordinate with the Users to verify that they are receiving valid data via the IOnet/CD. GTD will periodically monitor test events, coordinate playbacks with the user, provide troubleshooting assistance, and manage and control SN resources.

- **WSC**

  WSC will configure the modified MUX to transmit User spacecraft return link data via the Domsat and IOnet simultaneously. WSC will assist in troubleshooting network anomalies as well as providing real time support to the User.

- **Nascom**

  Nascom CDM will verify proper operations of the User CDs and modified MUX. Nascom will assist with troubleshooting anomalous conditions pertaining to loss and degradation of spacecraft data via Domsat and the IOnet.

- **FDF**

  Network Tracking Service Group will analyze tracking data via the IOnet. FDF will provide TDE, TDW and TDS emphemeris to the user.

- **SDPF**

  SDPF will receive and process spacecraft telemetry data in support of the user via the IOnet.

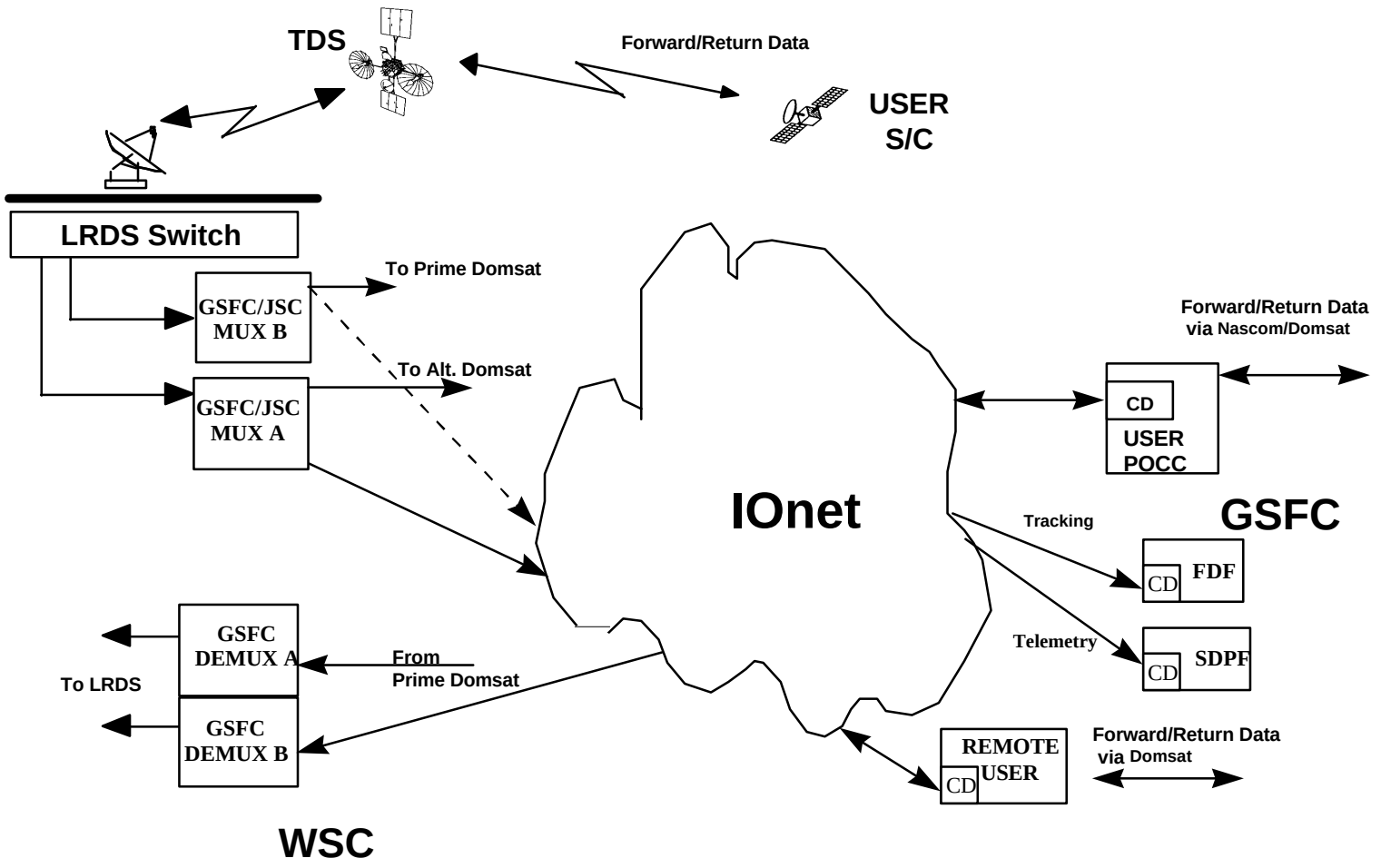

Figure 6-1 WSC S/N USER FORWARD/RETURN TEST

6.2 WSGT SN User Forward Link Verification Test

6.2.1 Purpose

The purpose of this test is to verify each individual SN User's forward command link via the CD/IOnet to insure that WSGT modified DEMUXes (A and B) mapping tables are correct and that Users can successfully command their spacecraft via this interface.

Objectives:

a) Schedule and verify all User POCC forward Logical Port Addresses (LPAs) to insure the mapping of the DEMUX tables at WSGT are accurate.

b) Verify the User's ability to support forward link commanding via a CD/IOnet and the modified WSGT DEMUXes.

6.2.2 Participants

a) USER POCC (s) (Refer to Appendix B and H)

b) NCC

c) WSGT

d) FDF

e) Nascom (CDM & NOC)

6.2.3 Test Configuration

The configuration for this test is shown in Figure 6-1.
TDRS Spare at WSGT will be used for this test.

6.2.4 Test Description

Each User POCC will be tested individually in this phase of testing. There will be three Users tested per day for approximately one week. Each User will be requested to schedule their assigned forward LPAs via CD/IOnet to ensure that the LPA mapping in

the WSGT modified DEMUXes (A and B) are accurate. Users will be requested to command their spacecraft using the procedure below.

6.2.5 Test Scenario: (User Forward Link)

a) Users will schedule all forward link LPAs from the matrix provided in Appendix B and User Module in Appendix H to verify that WSGT DEMUX (A and B) mapping tables are correct.

b) Users will schedule return services for command verification.

c) After S/C acquisition and IR lock, Users will be requested to transmit a NO OPS command to verify the link.

d) At the User's discretion they will transmit discrete commands and command loads to their spacecraft.

e) Evaluation Criteria - successful transmission and execution of spacecraft commands observed by the User.

6.2.6 Requirements

- **WSGT**

  GSFC DEMUX at WSGT will be in a split configuration (IP and Domsat). The DEMUX at WSGT will be configured via the LRDS to support Domsat on the A DEMUX and IOnet on the B DEMUX. This will require that the GSFC Alternate Domsat receive to the LRDS be reconfigured to the IOnet input at the Circuit Switch/Signal Splitter. WSGT will configure DEMUX A from Domsat to IOnet and vice versa as a requirement.

- **USER POCC**

  Users will schedule test modules via their scheduling interface with the NCC. Users will be requested to schedule tests during day shift hours (1200Z-2000Z). Users will use the test scenario in this document as a baseline procedure and applicable Briefing Messages for test conductance.

- **NCC**

  The GTD will be on console for this test during day shift hours and will assist in troubleshooting, managing and control of the SN resources.

- **FDF**

  The FDF's Network Tracking Service Group/Code 550 will analyze tracking data via the IOnet. FDF will provide TDS emphemeris to the users.

- **Nascom**

  Nascom NOC will configure the DEMUX mapping table and assist in monitoring and troubleshooting. Nascom will monitor and assist in the configuration of IP devices. If problems occur in the IOnet the Communication Manager will contact the appropriate contractual personnel for assistance in troubleshooting.

6.3 STGT SN User IOnet Verification Test

6.3.1 Purpose

The purpose of this test is to verify that the modified MUX/DEMUX at STGT and the CDs at the User POCCs are viable by being able to successfully transmit and receive User spacecraft data via the IOnet. All MUX/DEMUX transmit and receive service requirements as documented in the Appendices A, B, C, and H will be verified using the procedures described in this section.

Objectives:

a) Schedule and verify all User forward LPAs to ensure that Users CD and STGT's modified DEMUX properly map to the IOnet.

b) Verify the User's ability to support forward link commanding via a IOnet/CD and the modified STGT DEMUX.

c) Schedule and verify all User return LPAs to ensure that Users CD and STGT's modified MUX properly map to the IOnet.

d) Verify the validity of full period circuits.

6.3.2 Participants

a) User POCC(s) (Refer to Appendix A, B,C and H)

b) NCC

c) STGT

d) FDF

e) Nascom

f) SDPF

6.3.3 Test Configuration

a) The configuration for this test is shown in Figure 6-1.

b) TDRS East and West at STGT will be used for this test.

6.3.4 Test Description

SN Users will be requested to schedule tests for a duration of 8 hours a day for 2 to 3 days on TDE/TDW. Each User will be requested to schedule their assigned forward link and return link LPAs to ensure that proper mapping occurs at STGT's modified MUX/DEMUX in order for the User to transmit and receive data via the IOnet/CD.

6.3.5 Test Scenario

- **Configuration**

    a) Verify STGT's ability to configure their MDM from Domsat to IOnet to establish the user forward link and return link.

- **User Forward Link**

    a) Users will schedule all forward link LPAs from the matrix provided in Appendices B and H to substantiate that STGT DEMUX mapping tables are correct.

    b) After S/C acquisition and IR lock, Users will be requested to transmit a NO OPS command to verify the link.

    c) At the User's discretion they will transmit discrete commands and command loads to their spacecraft.

d) Users will verify command execution via return link telemetry.

e) Evaluation Criteria - successful transmission and execution of spacecraft commands observed by the User.

- **User Return Link**

a) Users will schedule all return link LPAs listed in Appendix A and C of this document.

b) Users will acknowledge receipt of telemetry via the IOnet/CD and Domsat links and advise GTD of data quality.

c) Users will transmit GCMRs to make data rate and mode changes as required.

d) Evaluation Criteria - Receipt of valid telemetry data at the POCC via the IONET/CD and the Domsat links as determined by the Users.

6.3.6 Requirements

- **User POCC**

User POCCs will be requested to schedule tests utilizing TDE and TDW for a duration of 8 hours a day for a period of 2 or 3 days. POCCs will use their normal operational support protocol with the NCC and STGT when supporting these events. Users will transmit commands and receive telemetry via the IOnet/CD.

- **STGT**

The GSFC/JSC MUXs at STGT will be configured to transmit via IOnet and Domsat simultaneously. The GSFC DEMUXes at STGT will be configured via the LRDS to support Domsat on the A DEMUX and IOnet on the B DEMUX. This will require that the GSFC alternate Domsat receive to the LRDS be reconfigured to the IOnet input at the Circuit Switch/Signal Splitter.

- **NCC**

The GTD will be on console for this test and will assist in troubleshooting, managing and control of the SN resources.

- **Nascom**

  Nascom CDM will verify proper operations of the User Conversion Devices and modified MDMs. Nascom will assist with troubleshooting anomalies pertaining to loss and degradation of spacecraft command and telemetry data via IOnet/CD.

- **SDPF**

  SDPF will receive telemetry and provide data processing services to the Principal Investigator (PI).

- **FDF**

  The Network Tracking Service Group will analyze user tracking data via the IOnet/CD.

7. JSC Network Modified MDM and IOnet Verification Test

7.1 Purpose

The purpose of this test is to verify that the Johnson Space Center / Mission Control Center (JSC/MCC) modified Multiplexer/Demultiplexers can successfully conduct Space Shuttle Orbiter (SSO) operations by utilizing the modified Multiplexer/Demultiplexer (MDM) at White Sands Ground Terminal (WSGT), via IP Operations Network (IOnet) interface established between JSC, Goddard Space Flight Center (GFSC), Marshall Spaceflight Center (MSFC), Onizuka Air Station (OAS) and Jet Propulsion Laboratory (JPL).

Objectives:

Objectives are listed progressively. Each objective will test interfaces associated with a given element of the network used to support Space Shuttle operations. As an objective is successfully completed the subsequent objectives build upon it by introducing another element of network support. Elements continue to be introduced until all elements of network support are activated and successfully tested. At this point all network resources are actively setting the stage to determine the amount of load on the network and exercising network failure and recovery scenarios to determine potential impact to Space Shuttle operations support.

a) Space Network

Verify that JSC/MCC modified MDMs can successfully transmit Space Shuttle forward commands, receive return telemetry utilizing TDE/TDW data stream id's (DSID), and receive tracking and command echo data via WSGT modified MDM and IOnet. Exercise transmission of Schedule Orders SHOs via the User Planning System (UPS) and Flight Data Files via the Flight Planning Systems (FPS). This will be accomplished by executing a modified version of the Space Network Verification/Validation Test Case 1201, documented in the 532-VTR-STDN Network Verification Manual for the Shuttle program dated January 1997.

b) Ground Network

Verify that JSC/MCC can successfully transmit Space Shuttle forward command, receive return telemetry, transmit Payload Data Interleaver System (PDIS) data, transmit vectors, receive tracking data, receive command echo, verify full period interfaces (FPS) and Scheduling Order (SHO) printer and conduct operations with

Ground Network (GN) resources utilizing the JSC modified MDM via the IOnet. Perform delay measurements on Air to Ground Voice and Ultra High Frequency (UHF) via the IOnet. Compare the results with the Domsat link to ensure the IOnet does not introduce any delay conditions that are not correctable.

Check the capability to utilize an Output Terminal Unit (OTU) vice a CD to receive Block Data Format (BDF) data from GN resources. Check the capability of the Input Terminal Unit (ITU) to transmit point to point (single destination code) data vice a CD. JSC will supply Destination I/F Channels to Nascom for this portion of the test so that they can be mapped to the logical port addresses.

c) Marshall Space Flight Center (MSFC) Interfaces

Verify that JSC/MCC can successfully transmit real-time Orbiter downlink data and orbiter downlink playback data to the MSFC customers. Verify the capability of the MSFC customer to send remote POCC commands successfully to JSC via the IOnet.

d) Deep Space Network (DSN) Interfaces

Verify that JSC/MCC can successfully transmit forward commands, receive return telemetry, and receive tracking data and command echo data from DSN ground stations accessed via JPL via the IOnet.

e) Remote Tracking Sites (RTS) Network (Onizuka)

Verify that JSC/MCC can successfully transmit forward command, receive return telemetry, transmit vectors, and conduct operations with the United States Air Force (USAF) Remote Tracking Sites (RTS) via the IOnet.

f) IOnet Network Loading

Verify that JSC/MCC can successfully conduct SSO operations utilizing all network resources (SN, GN, RTS, DSN) simultaneously to verify the capability of the IOnet to support the STS portion of the load.

g) IOnet Network Failure and Recovery

Verify that JSC/MCC can successfully conduct SSO operations utilizing all network resources (SN, GN, RTS, DSN) simultaneously to verify the IOnet capability and the response time to provide alternate routing in the event of a major network resource failure (router, T-1 etc.).

h) Tracking Data Verification

Verify the receipt of Shuttle tracking data via the CD/IOnet.

7.2 Participants

a) JSC/MCC

b) ESTL

c) WSGT

d) GSFC

e) NCC

f) FDF

g) MSFC

h) GN Sites

i) DSN Sites

j) RTS Sites (Onizuka)

k) Houston Comm Control

l) Nascom

m) SPIF

7.3 Test Configuration

The configuration for this test is shown in Figure 7-1. TDRS Spare will be used for this test. Note: K-band forward service is not available with TDS.

7.4 Test Description

This test will consist of testing JSC's modified MDM via the IOnet interface with WSC's modified MDMs, GN, DSN and RTS sites.

This test will be conducted in a progressive manner. After the initial objective is completed, starting with the first test scenario, other objectives will be built upon by completing subsequent test scenarios.

The Preliminary Test scenario verifies data flow to and from modified MDMs at JSC through Domsat and IOnet using BERTS data.

The SN scenario objectives will be verified by utilizing a modified version of the SN Verification/Validation "Test Case 1201".

The GN scenario testing will be accomplished by executing the following GN test scripts documented in the 532-VTR-STDN Network Verification Manual for Space Shuttle Programs, dated January 1997 and the 501-601 Network Operations Support Plan for Space Shuttle Programs. Test Cases are as follows: Test Case 1101, 1102, 1108, 2102, 2103, 3102, 3103, 3104, 4101, and 4102 as they apply to each GN site

7.5 Test Scenarios

- **JSC MDM Preliminary Test**

  Detailed procedures for the JSC MDM Preliminary Test are found in Appendices E and F. Appendix E contains the procedures for scenarios I-V between JSC and GSFC/MSFC/GN/RTS/DSN. Appendix F contains the procedures for scenarios I-V between JSC and WSC. Using BERTS data flows, the Domsat interfaces between JSC and GSFC and JSC and WSC will be verified. Using MUX A/MUX B with Domsat clock/NLIC clock the interfaces between JSC modified MDMs and GSFC, MSFC, GN, RTS and DSN will be verified using BERTS data flows. Also the applicable network and station will be configured to transmit a BERT to JSC OTUs via the IOnet. Similar BERT tests will verify the interfaces utilized for Shuttle support between JSC and WSC (WSGT and STGT). The preliminary test scenarios in Appendix E will be conducted prior to SN, GN, DSN, and RTS sites user test scenarios below.

- **Space Network**

  The VER/VAL Test Case Script 1201 will be conducted to verify the end-to-end SN systems used to support the SSO including the flow of control and status messages between the various elements via the modified MUX/DEMUX at WSGT, JSC and the IOnet interface. Any reference to TV, Statistical MUX in the VER/VAL Test Case Script 1201 will not be tested. K-band forward services via TDS at WSGT will not be tested due to spacecraft limitation.

- **Ground Network**

The GN test cases will be conducted in a progressive manner as listed in the test description. JSC will interface with each GN element via their modified MUX/DEMUX/IOnet/CD.

7.6 Requirements

- **JSC/MCC**

  JSC will configure to support this test via the modified MDM and IOnet. The WSC and GSFC Demultiplexers at JSC will be configured to support all Shuttle return services in a split configuration (Domsat and IP). The WSC/GSFC Demultiplexers at JSC will be configured to support the Prime Broadcast Domsat on the 'A1' and 'B1' Demultiplexers and IOnet on the 'A2' and 'B2' Demultiplexers. JSC Multiplexers will be configured to support the Shuttle Forward services forward link in a split configuration both (IP and Domsat) simultaneously.

- **JSC/ESTL**

  ESTL will emulate the SSO return and provide all telemetry as scheduled or as requested by GTD for this test. ESTL will verify SSO commands received from JSC/CMD (SDG).

- **WSGT**

  GSFC/JSC Multiplexers (MUXes) at WSGT will be configured to transmit via the Domsat and IOnet simultaneously. The JSC DEMUX at WSGT will be configured to support Domsat on the 'A' DEMUX and IOnet on the 'B' DEMUX. WSGT will also be responsible for monitoring the modified MUX/DEMUX configuration and assist with troubleshooting SN related anomalies.
  WSGT will configure to transmit shuttle tracking data to GFSC.

- **NCC**

  The GTD will be on console for this test during normal working (day shift) hours 1200z-2000z and will assist in troubleshooting, managing and control of the SN resources.

- **MSFC**

  MSFC will configure to receive real-time Orbiter down-link data and Orbiter down-link playback data via the IOnet. MSFC will configure to send remote POCC commands to JSC via the IOnet.

- **FDF**

  The Network Tracking Service Group (NTSG) will receive and analyze shuttle tracking data via the IOnet. FDF will provide TDS emphemeris to ESTL.

- **Nascom**

  The NOC will set configuration of MUX/DEMUX mapping tables provided by Nascom and shown in Appendices C and D. They will monitor tests and assist in troubleshooting. The CD Manager and Communication Manager will monitor and assist in the configuration of User Conversion Devices. If problems occur, Nascom will be responsible for troubleshooting the same.

- **Houston Comm Control**

  Houston Comm Control will be responsible for monitoring transmitted and received Shuttle data via the IOnet.

- **SPIF**

  The Shuttle POCC Interface Facility will be responsible for receiving SSO data via IOnet/CD.

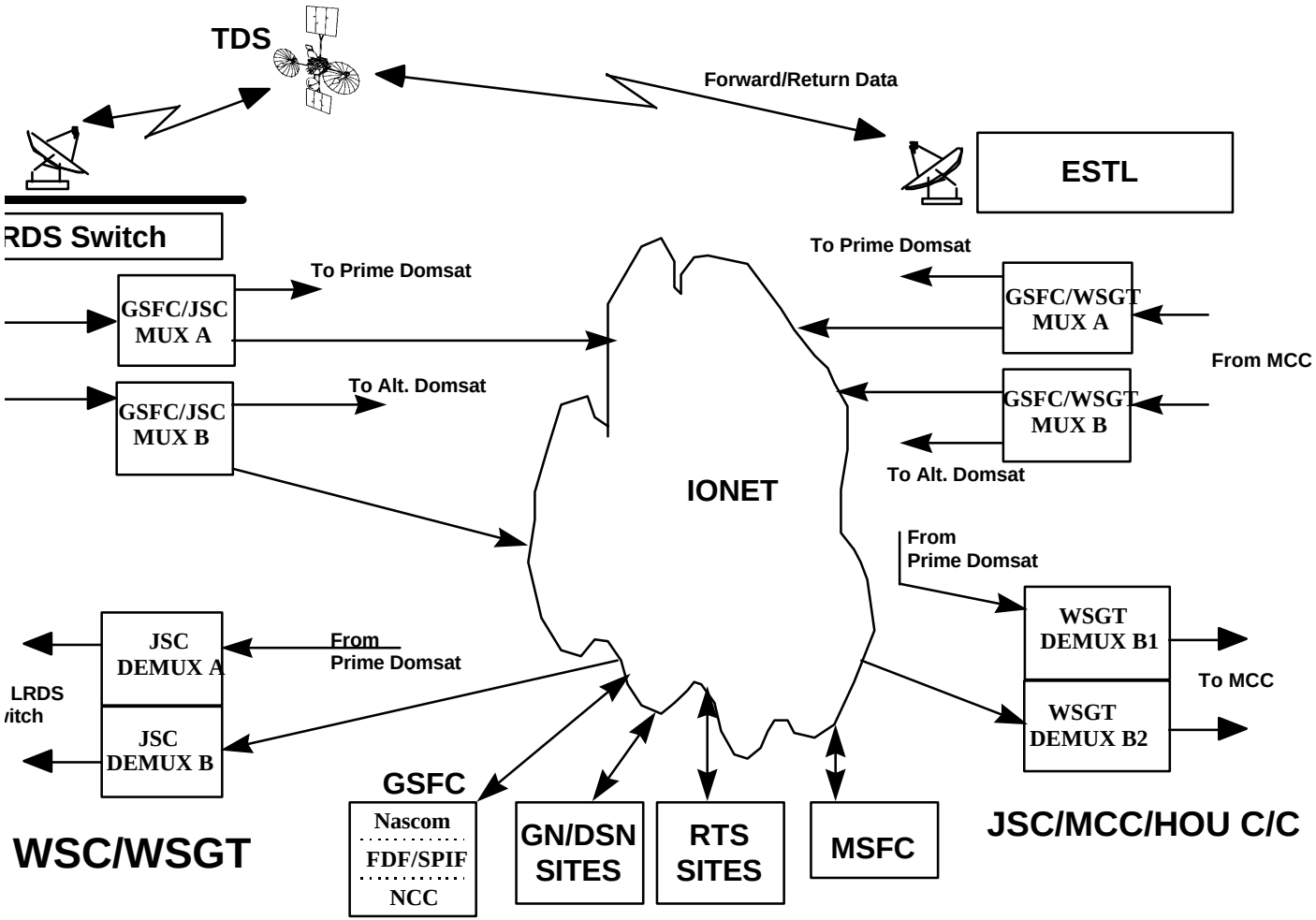

Figure 7-1 JSC MUX/DEMUX MOD TEST

8. SN Network Loading

8.1 Purpose

The purpose of this test is to demonstrate that the bandwidth of the IOnet and the MDM modification at WSC and JSC can support the throughput required when the network is loaded with SSO and scientific user spacecraft support from the SN, GN, DSN, and RTS sites.

Objectives:

a) Verify that the IOnet and the modified MDM's bandwidth can support multiple simultaneous users via the SN and GN, DSN, and RTS sites under load conditions.

b) Verify successful conductance of SSO and scientific user spacecraft operations via JSC/WSC's modified MDM IOnet/CD.

c) Verify successful conductance of SSO operations utilizing all network resources (SN,GN, RTS, DSN) simultaneously to verify JSC/WSC modified MDM/IOnet capability and the resources time to provide alternate routing in the event of a major network resource failure (router, T-1 etc.)

d) Verify the operability of the following full periods circuits:
Playback, Command Echo, Maintenance Channels, and GN/DSN TDRS support circuits via the modified MDM and IOnet/CD.

8.2 Participants

a) SN USERS

b) NCC

c) WSC

d) JSC/MCC/ESTL

e) MSFC

f) Nascom

g) FDF

h) GN

i) DSN

j) RTS

k) SDPF

l) Houston Comm Control

8.3 Test Configuration

The configuration for this test is shown in Figure 8.1 .
TDRS West, TDRS East, and TDRS Spare will be used for this test.

TDRS to GN handover support will be exercised with either F-6 or F-7.

8.4. Test Description

User POCCs, SN, GN, RTS, and DSN elements will be scheduled simultaneously to load the modified MDMs at JSC and WSC for a predetermined amount of time to demonstrate that the modified MDM can successfully support aggregate streams of users data and full period circuits via the IOnet/CD.

8.5 Test Scenario

The GTD will be assisted by the Network Integration and Analysis section (NIA) to conduct SSO exercises with JSC/MCC/ESTL, GN, DSN and RTS sites for this test. The GN/DSN sites will also participate in an exercise that will require them to receive a hand over from WSC TDRS Operations Control Center (TOCC) to support TDRS F-6 or F-7 via the modified MDM/IOnet.

Test scripts for SSO support are located in 532-VTR-STDN, Network Verification Manual for the Space Shuttle Program. Procedures for GN/DSN support of TDRS F-6 or F-7 are found in the 501-601/TDRSS Mission NOSP.

Verification of full period circuits will be tested by transmitting and/or receiving spacecraft signal data generator and BERT data between source and destination.

Users of scientific spacecraft will exercise normal spacecraft operations protocol with the WSC and NCC. Users are requested to schedule test modules. A Briefing Message will be provided to test participants with detailed instructions on test conductance.

8.6 Requirements

- **USER POCC (s)**

  Users will schedule support utilizing test modules from 4-5 hours a day for a period of 2-3 days to demonstrate that the modified MDM and IOnet/CD at WSC/JSC can support the throughput required under multiple network loading conditions.

- **NCC**

  The GTD will on the console for this test and will coordinate with the USER POCC (s) to insure that spacecraft operations via the IOnet/CD are valid. The GTD will monitor test events, provide troubleshooting assistance, and manage and control SN resources. GTD will verify the operability of any full period circuits to WSC from the NCC

- **WSC**

  The JSC/GSFC MUX at WSC will be configured to transmit User spacecraft return link telemetry data via the IOnet and Domsat simultaneously. The GSFC/JSC DEMUXes at WSC will be configured IP for user commanding.

- **JSC**

  JSC will configure to support this test via the modified MDM and IOnet/CD. The White Sands Complex (WSC) and GSFC DEMUXes at JSC will be configured to support all Shuttle return services in a split configuration (Domsat and IOnet). The WSC/GSFC DEMUXes at JSC will be configured to support the Prime Broadcast Domsat on the ‘A1’ and ‘B1’ DEMUXes and IOnet on the ‘A2’ and ‘B2’ DEMUXes. JSC MUXes will be configured to support the Shuttle Forward services in either the IOnet or DOMSAT mode but not simultaneously. JSC/MCC/ESTL will conduct SSO simulated operations with the ESTL emulating the Orbiter. GN, DSN and RTS sites will be scheduled to conduct Operational Exercises and will utilize the appendices C and D to schedule LPAs.

- **MSFC**

MSFC will configure to receive real-time Orbiter down-link data and Orbiter down-link playback data via the IOnet. MSFC will configure to send remote POCC commands to JSC via the IOnet.

- **GN, DSN and RTS**

  MILA and Bermuda (GN), Goldstone, Canberra and Madrid (DSN) and RTS sites will be scheduled to support SSO exercises for the duration of this test via the IOnet. The GN/DSN sites will participate in a hand over of TDRS S/C F-6 and/or F-7 command and telemetry support from WSC TOCC via the IOnet.

- **Nascom**

  Nascom CD Manager and NOC will verify proper operations of User Conversion Devices and modified MDMs. Nascom will assist with troubleshooting anomalies pertaining to loss or degradation of User spacecraft data via Domsat and IOnet/CD. Nascom CD Manager will be responsible for verifying the operability of applicable full period maintenance channels via the IOnet.

- **FDF**

  FDF will be responsible for receiving and processing user tracking data from WSC via the IOnet/CD. FDF will be responsible for providing TDS ephemeral data to SN Users and F-6 or F-7 pointing data to GN/DSN sites.

- **SDPF**

  SDPF will provide secondary telemetry and image data processing services to the Principal Investigator (PI). SDPF will receive and monitor telemetry data via legacy MDM and IOnet/CD.

- **Houston Comm Control**

  Houston Comm Control will be responsible for monitoring transmitted and received Shuttle data via the IOnet.

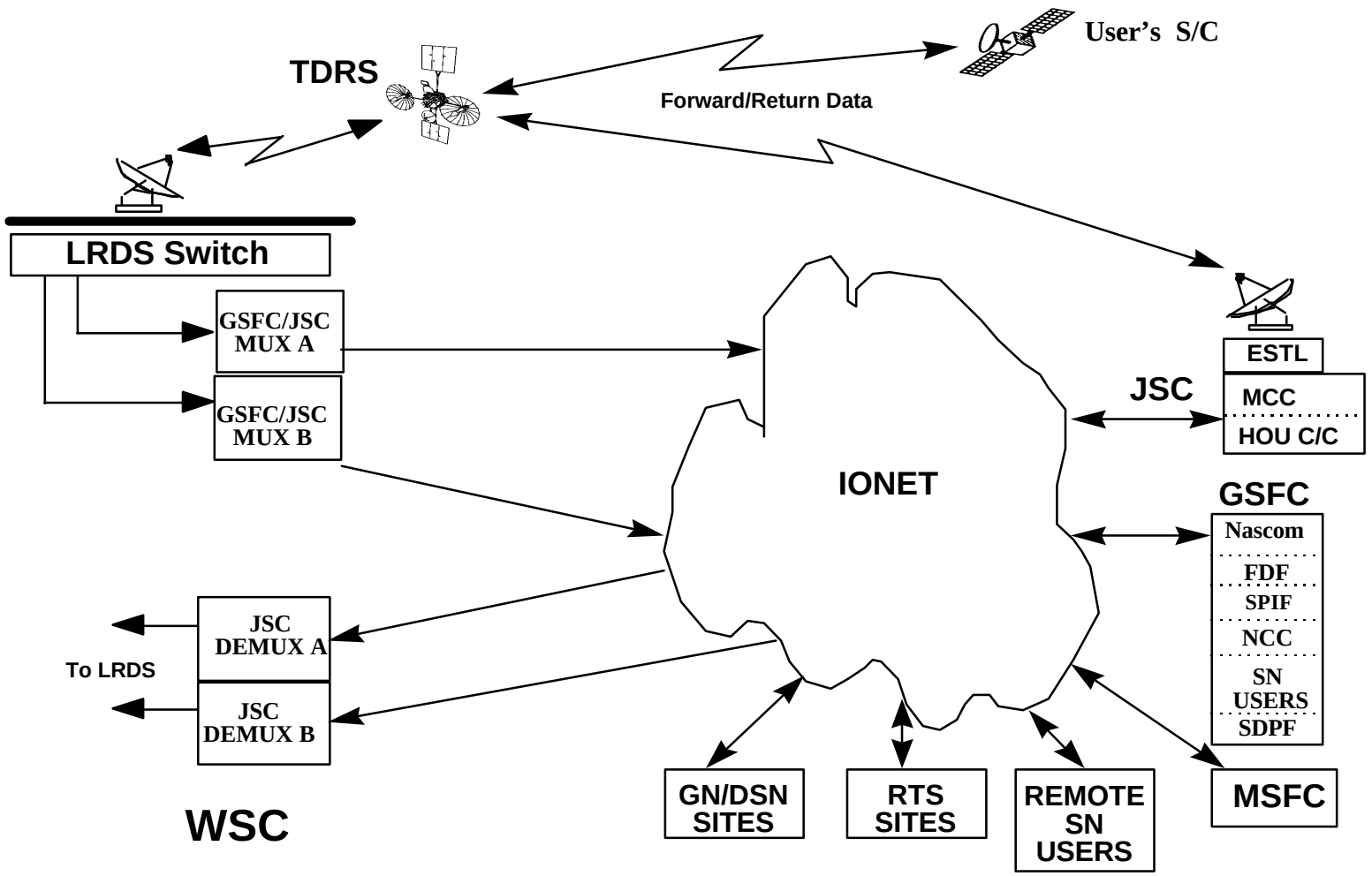

Figure 8-1 SN LOADING TEST

Appendix A - Return Services (from WSC)

These LPA mappings were current on 6/27/97. Updates will be provided when available.

SourceMDM	LPA	CircuitGroup	Project	DataType/Instrument	ClassDaddress	UDPport
WSC	1CC	E171/Misc.	Maint.	MDM Maintenance Channel	225.2.0.101	10460
WSC	1DD	E171/Misc.	Maint.	MDM Maintenance Channel	225.2.0.102	10477
WSC	1EE	E171/Misc.	Maint.	MDM Maintenance Channel	225.2.0.103	10494
WSC	1FF	E171/Misc.	Maint.	MDM Maintenance Channel	225.2.0.104	10511
STGT	267	JSC	JSC	STGT S-Band Command Echo	225.2.0.2	8267
STGT	268	JSC	JSC	STGT K-Band Command Echo	225.2.0.2	8268
STGT	269	JSC	JSC	STGT Playback Type I Data	225.2.0.2	8269
STGT	270	JSC	JSC	STGT TDRS Tracking Data	225.2.0.2	8270
WSC	201	FDF	FDF -	BRTS (sent at 1kb, receive set at 56kb) WHSJ	225.1.0.19	8201
WSC	202	FDF	FDF -	BRTS (sent at 1kb, receive set at 56kb) WH2J	225.1.0.19	8202
WSC	203	FDF	FDF -	BRTS (sent at 1kb, receive set at 56kb) ACNJ	225.1.0.19	8203
WSC	204	FDF	FDF -	BRTS (sent at 1kb, receive set at 56kb) ALSJ	225.1.0.19	8204
WSC	205	FDF	FDF -	BRTS (sent at 1kb, receive set at 56kb) AMSJ	225.1.0.19	8205
WSC	206	FDF	FDF -	BRTS (sent at 1kb, receive set at 56kb) AC2J	225.1.0.19	8206
WSC	207	E171/Misc.	KSC	ELV TDE	225.1.0.32	8207
WSC	208	E171/Misc.	KSC	ELV TDW	225.1.0.32	8208
WSC	209	MultiSat/ERBS	ERBS	ERBS MA/SSA I Channel Return & MA/SSA Forward	225.1.0.2	8010
WSC	210	MultiSat/ERBS	ERBS	ERBS MA/SSA Q Channel Return	225.1.0.2	8020
WSC	211	MultiSat/EUVE	EUVE	EUVE MA/SSA I Channel Return & MA/SSA Forward	225.1.0.3	8010
WSC	212	MultiSat/EUVE	EUVE	EUVE MA/SA Q Channel Return	225.1.0.3	8020
WSC	213	GRO	GRO	GRO MA/SSA I Channel Return & MA/SSA Forward	225.1.0.4	8010
WSC	214	GRO	GRO	GRO MA/SSA Q Channel Return	225.1.0.4	8020
WSC	215	HST/STOCC	HST	HST MA/SSA I Channel Return	225.1.0.1	8010
WSC	216	HST/STOCC	HST	HST MA/SSA Q Channel Return	225.1.0.1	8020
WSC	217	HST/STOCC	HST	HST SSA Return, I Channel High Data Rate	225.1.0.1	8015
WSC	219	LSAT 4/5	LSAT	LND MA/SSA I Channel Return & MA Forward	225.1.0.7	8010
WSC	220	LSAT 4/5	LSAT	LND MA/SSA QChannel Return & SSA Forward	225.1.0.7	8020
WSC	221	B25/SOC/N171	RDD	RDD MA/SSA I Channel Return	225.1.0.13	8010
WSC	222	B25/SOC/N171	RDD	RDD MA/SSA Q Channel Return	225.1.0.13	8020
WSC	223	JPL/TOPEX	TOPEX	TOPEX MA/SSA I Channel Return	225.1.0.15	8010
WSC	225	MultiSat/UARS	UARS	UARS MA/SSA I Channel Return & MA/SSA Forward	225.1.0.17	8010
WSC	226	MultiSat/UARS	UARS	UARS MA/SSA Q Channel Return	225.1.0.17	8020
WSC	227	LDBP	LDBP	LDBP Command and MA/SSA Q CH Return	225.1.0.6	8010
WSC	228	LDBP	LDBP	LDBP MA/SSA Q CH Return	225.1.0.6	8020

SourceMDM	LPA	CircuitGroup	Project	DataType/Instrument	ClassDaddress	UDPport
WSC	229	JPL/TOPEX	TOPEX	TOPEX MA/SSA Q Channel Return	225.1.0.15	8020
WSC	231	JSC	JSC	SSAR TDRS-East	225.2.0.2	8231
WSC	232	JSC	JSC	KSAR Channel 1 TDRS-East	225.2.0.2	8232
WSC	233	JSC	JSC	KSAR Channel 2 TDRS-East	225.2.0.3	8233
WSC	233	MSFC	MSFC	960k/1.024Mb OD dumps, 640 Kb OARE - real-time	225.2.0.3	8233
WSC	233	MSFC	MSFC	<2Mb Composite Spacelab Science - playback	225.2.0.3	8233
WSC	233	MSFC	MSFC	960 SSME Dumps	225.2.0.3	8233
WSC	233	MSFC	MSFC	<2Mb Composite Spacelab Science - real-time	225.2.0.3	8233
WSC	233	SPIF	SPIF	STS KBAND single access Return CH-2	225.2.0.3	8233
WSC	233	SPIF	SPIF	STS KBAND single access Return CH-2	225.2.0.3	8233
WSC	234	JSC	JSC	KSAR Channel 3 TDRS-East	225.2.0.2	8234
WSC	235	JSC	JSC	SSAR TDRS-West	225.2.0.2	8235
WSC	236	JSC	JSC	unused per Al Thomas 5/12/97 - was KSAR Channel 1 TDRS-West	225.2.0.2	10236
WSC	237	JSC	JSC	unused per Al Thomas 5/12/97 - was KSAR Channel 2 TDRS-West	225.2.0.6	10237
WSC	237	SPIF	SPIF	STS KBAND single access Return CH-2	225.2.0.6	10237
WSC	237	SPIF	SPIF	STS KBAND single access Return CH-2	225.2.0.6	10237
WSC	238	JSC	JSC	unused per Al Thomas 5/12/97 - was KSAR Channel 3 TDRS-West	225.2.0.2	10238
WSC	239	TPOCC/XTE	XTE	XTE MSA Return I CHAN & MSA Forward	225.1.0.18	8010
WSC	240	TPOCC/XTE	XTE	XTE MSA Return Q CHAN	225.1.0.18	8020
WSC	241	SDPF/PORTCOM	PORTCO	PORTCOM MA Return	225.1.0.12	8241
WSC	249	SDPF/PORTCOM	PORTCO	PORTCOM MA Return & MA Forward	225.1.0.12	8249
WSC	250	SDPF/PORTCOM	PORTCO	PORTCOM MA Return & MA Forward	225.1.0.12	8250
WSC	251	TRMM	TRMM	TRMM SSA Return I CHAN & SSA Forward	225.1.0.16	8010
WSC	252	TRMM	TRMM	TRMM SSA Return Q CHAN	225.1.0.16	8020
WSC	260	MultiSat/ERBS	ERBS	ERBS Type-I Playback	225.1.0.30	8040
WSC	261	MultiSat/ERBS	ERBS	ERBS Type-I Playback	225.1.0.31	8030
WSC	601	WSC/ETGT	MILA	TDRSS Command - dest code 1	225.0.0.1	8001
WSC	602	WSC/ETGT	Bermuda	TDRSS Command - dest code 4	225.0.0.4	8001
WSC	603	WSC/ETGT	Santiago	TDRSS Command - dest code 10 (octal)	225.0.0.8	8001
WSC	604	WSC/ETGT	FDF	tracking data - dest code 117 (octal)	225.0.0.79	8001
WSC	605	WSC/ETGT	Wallops	TDRSS Command - dest code 140 (octal)	225.0.0.96	8001
WSC	610	WSC/ETGT	JSC	TDRSS Command to/from JSC - dest code 117 (octal)	tbd	8610
WSC	620	WSC/ETGT	DSS-16	TDRSS Command - dest code 204 (octal)	225.0.0.132	8001
WSC	621	WSC/ETGT	DSS-46	TDRSS Command - dest code 225 (octal)	225.0.0.149	8001
WSC	622	WSC/ETGT	Onizuka	TDRSS Command - dest code 244 (octal)	225.0.0.164	8001
WSC	623	WSC/ETGT	DSS-17	TDRSS Command - dest code 333 (octal)	225.0.0.219	8001
WSC	624	WSC/ETGT	DSS-66	TDRSS Command - dest code 366 (octal)	225.0.0.246	8001
WSC	TBD	LDBP	LDBP	LDBP MA/SSA Q CH Return	225.1.0.6	8020
WSC	TBD	LDBP	LDBP	LDBP Command and MA/SSA I CH Return	225.1.0.6	8010
WSGT	367	JSC	JSC	WSGT S-Band Command Echo	225.2.0.2	8367

SourceMDM	LPA	CircuitGroup	Project	DataType/Instrument	ClassDaddress	UDPport
WSGT	368	JSC	JSC	WSGT K-Band Command Echo	225.2.0.2	8368
WSGT	369	JSC	JSC	WSGT Playback Type I Data	225.2.0.2	8369
WSGT	370	JSC	JSC	WSGT TDRS Tracking Data	225.2.0.2	8370

Appendix B - Forward Services (to WSC)

These LPA mappings were current on 6/27/97. Updates will be provided when available.

DestMDM	LPA	Project	DataType/Instrument	ClassDaddres	UDPport	SourceNetwork	mask
WSC	106	tbd	ISS Test port	225.2.0.1	10106		
WSC	108	TRMM	TRMM SSA Return I CHAN & SSA Forward	225.2.0.1	10108	150.144.178.37	255.255.255.255
WSC	109	ARC	STARLINK KSA Forward	225.2.0.1	10109	150.144.186.245	255.255.255.255
WSC	110	tbd	Bozeman MAF	225.2.0.1	10110		
WSC	111	ERBS	ERBS MA/SSA I Channel Return & MA/SSA Forward	225.2.0.1	10111	150.144.180.228	255.255.255.255
WSC	112	EUVE	EUVE MA/SSA I Channel Return & MA/SSA Forward	225.2.0.1	10112	150.144.180.237	255.255.255.255
WSC	113	GRO	GRO MA/SSA I Channel Return & MA/SSA Forward	225.2.0.1	10113	150.144.181.149	255.255.255.255
WSC	114	HST	HST MA/SSA Forward	225.2.0.1	10114	150.144.x.x	255.255.xxx.xxx
WSC	115	LSAT	LND MA/SSA I Channel Return & MA Forward	225.2.0.1	10115	150.144.184.229	255.255.255.255
WSC	116	LSAT	LND MA/SSA QChannel Return & SSA Forward	225.2.0.1	10116	150.144.184.229	255.255.255.255
WSC	117	TOPEX	TOPEX MA/SSA Forward	225.2.0.1	10117	150.144.186.21	255.255.255.255
WSC	118	UARS	UARS MA/SSA I Channel Return & MA/SSA Forward	225.2.0.1	10118	150.144.180.238	255.255.255.255
WSC	119	LDBP	LDBP Command and MA/SSA Q CH Return	225.2.0.1	10119	150.144.184.101	255.255.255.255
WSC	122	JSC	CAS Data (CAS-1)	225.2.0.4	10122	150.144.187.32	255.255.255.240
WSC	126	WSC	TDRS TLM-1 - dest code 65 (octal)	225.0.0.53	8001	150.144.0.0	255.255.0.0
WSC	129	WSC	TDRS TLM-2 - dest code 265 (octal)	225.0.0.181	8001	150.144.0.0	255.255.0.0
WSC	138	XTE	XTE MSA Return I CHAN & MSA Forward	225.2.0.1	10138	150.144.180.165	255.255.255.255
WSC	141	PORTCOM	PORTCOM MA Return & MA Forward	225.2.0.1	10141	150.144.176.76	255.255.255.255
WSC	1EE	Maint.	MDM Maintenance Channel	225.2.0.103	10494	150.144.0.0	255.255.0.0
WSC	401	JSC	KSAF (SN KSA1)	225.2.0.1	10401	150.144.187.32	255.255.255.240
WSC	402	JSC	KSAF (SN KSA2)	225.2.0.1	10402	150.144.187.32	255.255.255.240
WSC	403	JSC	SSAF TDRS-East	225.2.0.1	10403	150.144.187.32	255.255.255.240
WSC	404	JSC	SSAF TDRS-West	225.2.0.1	10404	150.144.187.32	255.255.255.240
WSC	tbd	LDBP	LDBP Command and MA/SSA I CH Return	225.2.0.1		150.144.184.101	255.255.255.255
WSC	VAR	PORTCOM	PORTCOM MA Return & MA Forward	225.2.0.1		150.144.176.76	255.255.255.255
WSC	1DD	Maint.	MDM Maintenance Channel	225.2.0.102	10477	150.144.0.0	255.255.0.0
WSC	1FF	Maint.	MDM Maintenance Channel	225.2.0.104	10511	150.144.0.0	255.255.0.0
WSC	2FF	Maint.	MDM Maintenance Channel	225.2.0.106	11023	150.144.0.0	255.255.0.0

Appendix C - JSC Transmit Requirements

These LPA mappings were current on 6/27/97. Updates will be provided when available.

SourceMDM	LPA	CircuitGroup	Project	DataType/Instrument	ClassDaddress	UDPport
JSC	122	Onizuka	Onizuka	CAS Telemetry to ONZ dest code 26 (octal)	225.0.0.22	8001
JSC	125	Onizuka	Onizuka	ICV data to ONZ	225.1.0.20	8125
JSC	126	MPS	MPS	MPS Return \FP (was CAPS II) & Return	225.1.0.8	8050
JSC	127	JSC	JSC	PDIS Interface 4 (Mission Unique) / (PAY-4)	225.1.0.127	8127
JSC	181	JSC	JSC	SSAF 32K throughput to GN	225.1.0.22	8181
JSC	182	Onizuka	Onizuka	Onizuka (SVL) 72KB Thruput cmds to Onizuka	225.1.0.21	8182
JSC	187	JSC	JSC	MSFC playback	225.1.0.9	8187
JSC	188	JSC	JSC	SLS 19.2K to MSFC	225.1.0.9	8188
JSC	189	JSC	JSC	User Planning System (JSC-4) dest code 217 (octal)	225.0.0.143	8001
JSC	401	JSC	JSC	KSAF (SN KSA1)	225.2.0.1	8403
JSC	402	JSC	JSC	KSAF (SN KSA2)	225.2.0.1	8402
JSC	403	JSC	JSC	SSAF TDRS-East	225.2.0.1	8403
JSC	404	JSC	JSC	SSAF TDRS-West	225.2.0.1	8404
JSC	105	MSFC	MSFC	4.8k CAP CMD - realtime - over HUN-1	225.1.0.9	8105
JSC	105	MSFC	MSFC	4.8k State Vector- realtime - over HUN-1	225.1.0.9	8105
JSC	105	MSFC	MSFC	4.8 CMD History - realtime - over HUN-1	225.1.0.9	8105
JSC	106	MSFC	MSFC	192/128/96/64 k OD - playback (or DDH/RTS P/B STS-xxx)	225.1.0.9	8106
JSC	106	MSFC	MSFC	1.024m IUS Dump	225.1.0.9	8106
JSC	117	MSFC	MSFC	192/128/96/64 k OD -realtime (SKR data)	225.1.0.9	8117
JSC	184	MSFC	MSFC	16k IUS	225.1.0.9	8184
JSC	193	MSFC	MSFC	64k IUS	225.1.0.9	8193
JSC	TBD	MSFC	MSFC	***Experimental Streams (5 of 5)	225.1.0.9	
JSC	TBD	MSFC	MSFC	***Experimental Streams (1 of 5)	225.1.0.9	
JSC	TBD	MSFC	MSFC	Spacelab Experiment Stream - realtime	225.1.0.9	
JSC	TBD	MSFC	MSFC	***Experimental Streams (2 of 5)	225.1.0.9	
JSC	TBD	MSFC	MSFC	***Experimental Streams (4 of 5)	225.1.0.9	
JSC	TBD	MSFC	MSFC	***Experimental Streams (3 of 5)	225.1.0.9	
JSC	1CC	E171/Misc.	Maint.	MDM Maintenance Channel	225.2.0.101	10460
JSC	1DD	E171/Misc.	Maint.	MDM Maintenance Channel	225.2.0.102	10477
JSC	1EE	E171/Misc.	Maint.	MDM Maintenance Channel	225.2.0.103	10494
JSC	1FF	E171/Misc.	Maint.	MDM Maintenance Channel	225.2.0.104	10511

Appendix D - JSC Receive Requirements

These LPA mappings were current on 6/27/97. Updates will be provided when available.

DestMDM	LPA	Project	DataType/Instrument	ClassDaddres	UDPport	SourceNetwork	mask
JSC	121	MPS	MPS Return \FP (was CAPS II) & Return	225.2.0.2	10121	150.144.181.165	255.255.255.255
JSC	125	Onizuka	Onizuka (SVL) 960/1024KB FM Data to JSC	225.2.0.2	10125	Onizuka via GSFC	
JSC	131	Onizuka	Onizuka (SVL) OD data	225.2.0.2	10131	Onizuka	
JSC	132	JSC	TDRS Event Schedule Printer	225.2.0.2	10132	GSFC	255.255.255.255
JSC	135	JSC	User Planning System (JSC-4) dest code 33 (octal)	225.0.0.27	8001	GSFC	255.255.255.255
JSC	174	Onizuka	Onizuka (SVL) Command Echo	225.2.0.2	10174	GSFC or Onizuka	255.255.x.x
JSC	1CC	Maint.	MDM Maintenance Channel	225.2.0.101	10460	150.144.0.0	255.255.0.0
JSC	231	JSC	SSAR TDRS-East	225.2.0.2	10231	150.144.189.0	255.255.255.0
JSC	232	JSC	KSAR Channel 1 TDRS-East	225.2.0.2	10232	150.144.189.0	255.255.255.0
JSC	233	JSC	KSAR Channel 2 TDRS-East	225.2.0.3	10233	150.144.189.0	255.255.255.0
JSC	234	JSC	KSAR Channel 3 TDRS-East	225.2.0.2	10234	150.144.189.0	255.255.255.0
JSC	235	JSC	SSAR TDRS-West	225.2.0.2	10235	150.144.189.0	255.255.255.0
JSC	236	JSC	KSAR Channel 1 TDRS-West	225.2.0.2	10237	150.144.189.32	255.255.255.224
JSC	238	JSC	KSAR Channel 3 TDRS-West	225.2.0.2	10238	150.144.189.32	255.255.255.224
JSC	267	JSC	STGT S-Band Command Echo	225.2.0.2	10267	150.144.189.128	255.255.255.224
JSC	268	JSC	STGT K-Band Command Echo	225.2.0.2	10268	150.144.189.128	255.255.255.224
JSC	269	JSC	STGT Playback Type I Data	225.2.0.2	10269	150.144.189.128	255.255.255.224
JSC	270	JSC	STGT TDRS Tracking Data	225.2.0.2	10270	150.144.189.128	255.255.255.224
JSC	367	JSC	WSGT S-Band Command Echo	225.2.0.2	10367	150.144.189.32	255.255.255.224
JSC	368	JSC	WSGT K-Band Command Echo	225.2.0.2	10368	150.144.189.32	255.255.255.224
JSC	369	JSC	WSGT Playback Type I Data	225.2.0.2	10369	150.144.189.32	255.255.255.224
JSC	370	JSC	WSGT TDRS Tracking Data	225.2.0.2	10370	150.144.189.32	255.255.255.224
JSC	TBD	MSFC	Spacelab EXP. Stream	225.2.0.5		150.144.188.0	255.255.255.0
JSC	TBD	MSFC	51.2/25.6 Sim ECIO	225.2.0.5		150.144.188.56	255.255.255.255
JSC	237	JSC	KSAR Channel 2 TDRS-West	225.2.0.6	10236	150.144.189.32	255.255.255.224
JSC	1DD	Maint.	MDM Maintenance Channel	225.2.0.102	10477	150.144.0.0	255.255.0.0
JSC	1FF	Maint.	MDM Maintenance Channel	225.2.0.104	10511	150.144.0.0	255.255.0.0
JSC	2FF	Maint.	MDM Maintenance Channel	225.2.0.106	11023	150.144.0.0	255.255.0.0

Appendix E - JSC/GSFC/MSFC/GN/RTS/DSN Preliminary Test

(Scenarios I-V)

This appendix includes JSC Modified MDM and IOnet Preliminary Test procedures.

E.1 Test Scenario I - Verify JSC/GSFC Domsat Interfaces

E.1.1 Objective

This scenario will verify the integrity of the modified MDM equipment to support the nominal interfaces utilized for Space Shuttle support between JSC and GSFC. Interfaces to be validated for this scenario include the JSC DOMSAT (Prime and Alternate Broadcast Systems) and GSFC (Prime and Alternate Broadcast Systems). JSC will utilize the Prime Broadcast Common Carrier Clock to provide timing (2.5MB) for Multiplexer "A" and the Alternate Broadcast Common Carrier Clock to provide timing (2.5MB) for Multiplexer "B".

E.1.2 System Configuration

1. Comm Control ensure the following connections are made in the CDSS to place the MDM into the configuration needed for this test scenario. Please use the Broadcast to Port method of connection in the CDSS.

Input (DTE) Broadcast	Output (DCE) Port
BCLKP	MUX-A-T
BCLKA	MUX-B-T
MUX-A	BCTP
MUX-B	BCTA
GSFCP	DMUXA1
GSFCA	DMUXA2

E.1.3 Input Terminal Unit (ITU) Test

1. Comm Control ensure the following connections are made in the CDSS to configure a Data Transmission Test Set to the ITU under test. The Data Transmission Test Set should output the nominal 2047 pattern at the appropriate rate for a given interface. Please use the Broadcast to Group method of connection in the CDSS when

connecting the test set to the ITU. Note the ITU's that are required to be checked out are listed in table 1-1.

	Input (DTE) Broadcast	Output (DCE) Group
	TEST SET x I	ITU-xx (UST Interfaces)
*	PTCHxx-I	ITU-xx (BDF Interfaces)

* Manual patches will be required in the Wideband Patchbay (WBPB) to connect the output of the Data Block Emulator (DBE) Send Data Unit (SDU) to the selected wideband patch, then subsequently make the CDSS connection noted above to connect the patch to the ITU under test.

2. Comm Control confirm that the ITU that is under test is enabled and configured per the parameters listed in table 1-1.

3. Comm Control confirm with GSFC Tech Control the port address and configuration of the MDM interface under test. Confirm GSFC Tech Control is configured to receive the BERT from us via the JSC Prime Broadcast Signal.

4. Comm Control seek confirmation from GSFC Tech Control that they are locked up error free to the BERT we are transmitting to them via the JSC Prime Broadcast. Once confirmation has been received, allow the test to run for 15 minutes. Pass / Fail criteria is based on specifications for Type I interfaces outlined in NASA Communications (NASCOM) Operating Procedures(NASCOP) Volume 2, Revision 2, September 1996, Section 5.10 "Proof of Performance". The interface should achieve a minimum of 99.5% error free throughput with no resync's detected by the receiving test set.

5. After 15 minutes request from GSFC Tech Control the results of the test. Annotate the results on the worksheet provided for the ITU under test in the category "DOMSAT Interface Prime Broadcast".

6. Comm Control request GSFC Tech Control reconfigure their test equipment to receive the BERT from us via the JSC Alternate Broadcast.

7. Comm Control seek confirmation from GSFC Tech Control that they are locked up error free to the BERT we are transmitting to them via the JSC Alternate Broadcast. Once confirmation has been received, allow the test to run for 15 minutes. Pass / Fail criteria is based on specifications for Type I interfaces outlined in NASA Communications (NASCOM) Operating Procedures(NASCOP) Volume 2, Revision 2, September 1996, Section 5.10 "Proof of Performance". The interface should achieve a minimum of 99.5% error free throughput with no resync's detected by the receiving test set.

8. After 15 minutes request from GSFC Tech Control the results of the test. Annotate the results on the worksheet provided for the ITU under test in the category "DOMSAT Interface Alternate Broadcast".

9. Repeat steps 1 through 8 for each of the ITU's identified in table 1-1.

10. Proceed the Output Terminal Unit (OTU) portion of the test.

Table 1-1

JSC PRIME AND ALTERNATE BROADCAST TO NASCOM / MULTIPLEXERS "A" & "B"

GSFC INTERFACES

ITU	PA	CHID	CONFIGURATION			MSG TYPE	DESCRIPTION
17	0117		192K	TT	UST	19	OD DATA
19	01DD	DD	9.6K	TT	UST	19	GSFC MAINTENANCE CHANNEL
22	0122		56K	TT	BDF	19	CAS-1: PDIS FEP / CAS
25	0125		56K	TT	BDF	19	CKT SW I/F VECTORS TO OAFB
26	0126		9.6K	TT	UST	19	FLIGHT PLANNING SYSTEM
31	0181	A0	32K	TT	UST	19	SSAF THROUGHPUT TO GN
32	0182	A1	72K	TT	UST	19	KSAF THROUGHPUT TO GN / RTS
33	0183		56K	TT	BDF	19	PAY-1: PDIS (MISSION UNIQUE)
34	0184		56K	TT	BDF	19	PAY-2: PDIS (MISSION UNIQUE)
35	0185		56K	TT	BDF	19	PAY-3: PDIS (MISSION UNIQUE)
36	0186	A0	32K	TT	UST	19	SSAF THROUGHPUT TO GN / RTS
37	0187		128K	TT	UST	19	MSFC PLAYBACK
38	0188		56K	TT	BDF	19	JSC-1: 2ND INPUT TO NASCOM MSG SWITCH
39	0189		56K	TT	BDF	19	JSC-4: USER PLANNING SYSTEM
40	0190		56K	TT	BDF	19	JSC-3: PRI INPUT TO NASCOM MSG SWITCH

E.1.4 Output Terminal Unit (OTU) Test

1. Comm Control ensure the following connections are made in the CDSS to configure a Data Transmission Test Sets to the OTU's under test. The Data Transmission Test Set should be configured to receive a nominal 2047 pattern with the block size set to 4800 bits. Please use the Broadcast to Port method of connection in the CDSS when connecting the test sets to the OTU's. Note the OTU's that are required to be checked out are listed below in table 1-2.

Input (DTE) Broadcast	Output (DCE) Port
OTU-xx-A1 (BDF Interfaces)	TEST SET x O (UST Interfaces) or * PTCHxx-O
OTU-xx-A2 (BDF Interfaces)	TEST SET x O (UST Interfaces) or * PTCHxx-O

* Manual patches will be required in the Wideband Patchbay (WBPB) to connect the selected wideband patch to the input of the Data Block Emulator (DBE) Receive Data Unit (RDU), then subsequently make the CDSS connection noted above to connect the OTU under test to the selected wideband patch.

2. Comm Control confirm that the OTU's that are under test are enabled and configured per the parameters listed in table 1-2.

3. Comm Control confirm with GSFC Tech Control the port address and configuration of the MDM interface under test. Confirm GSFC Tech Control is configured to transmit a BERT on the MDM interface identified for test.

4. Comm Control notify GSFC Tech Control that you are locked up error free to the BERT they are transmitting to us via the GSFC Prime and Alternate Broadcast. Once confirmation has been provided to GSFC Tech Control, allow both tests to run for 15 minutes. Pass / Fail criteria is based on specifications for Type I interfaces outlined in NASA Communications (NASCOM) Operating Procedures(NASCOP) Volume 2, Revision 2, September 1996, Section 5.10 "Proof of Performance". The interface should achieve a minimum of 99.5% error free throughput with no resync's detected by the receiving test set.

5. After 15 minutes notify GSFC Tech Control to report the results of the test. Annotate the results on the worksheet provided for the OTU's under test in the category "DOMSAT Interface GSFC Prime Broadcast" for OTU-xx-A1 and "DOMSAT Interface GSFC Alternate Broadcast" for OTU-xx-A2.

6. Repeat steps 1 through 5 for each pair of the OTU's identified in table 1-2.

Table 1-2

DATA RECEIVED FROM GSFC / DEMULTIPLEXER'S "A1" (PRIME) & "A2" (ALTERNATE)
GSFC INTERFACES

OTU		PA		CONFIGURATION			DESCRIPTION
12		0174		32/72K	IC/CL	UST	JSC-6: GN / RTS COMMAND ECHO SSAF
19		01DD		9.6K	IC	UST	GSFC MAINTENANCE CHANNEL
21		0121		9.6K	IC	UST	FLIGHT PLANNING SYSTEM
25		0125		1024K	IC/TR	UST	RTS RECORDER DUMP
31		0131		192K	IC/TR	UST	JSC-5: 2ND OUTPUT FROM NASCOM MSG SWITCH
32		0132		9.6K	IC	UST	CSS/NASCOM EVENT PRINTER
35		0135		56K	IC	BDF	JSC-4: UPS
36		0136		840K	IC	BDF	JSC-3: PRI OUTPUT FROM NASCOM MSG SWITCH

7. End of test procedure for Test Scenario I. Please return the system under test back to its nominal support configuration. Proceed to the next test scenario.

E.2 Test Scenario II - JSC to GSFC / MSFC / GN / RTS / DSN via IOnet from MUX A using DOMSAT Clock

E.2.1 Objective:

This scenario will verify the integrity of the modified MDM equipment to support the nominal interfaces utilized for Space Shuttle support between JSC and GSFC, MSFC, GN, RTS DSN. Interfaces to be validated for this scenario include the JSC Multiplexer "A" transmit capability to GSFC, MSFC, GN, RTS and DSN via the IONET and where applicable the integrity of the IONET to NASCOM 2000 interface. Also the capability to receive from GSFC, MSFC, GN, RTS and DSN via the IONET utilizing Demultiplexers "A1" and "A2". JSC will utilize the Prime Broadcast Common Carrier Clock to provide timing (2.5MB) for Multiplexer "A".

E.2.2 System Configuration

1. Comm Control ensure the following connections are made in the CDSS to place the MDM into the configuration needed for this test scenario. Please use the Broadcast to Port method of connection in the CDSS.

Input (DTE) Broadcast Output (DCE) Port

BCLKP	MUX-A-T
MUX-A	MUX-A-NLIC
DMUX-A1-NLIC	DMUXA1
DMUX-A2-NLIC	DMUXA2

E.2.3 Input Terminal Unit (ITU) Test

1. Comm Control ensure the following connections are made in the CDSS to configure a Data Transmission Test Set to the ITU under test. The Data Transmission Test Set should output the nominal 2047 pattern at the appropriate rate for a given interface. Please use the Broadcast to Group method of connection in the CDSS when connecting the test set to the ITU. Note the ITU's that are required to be checked out are listed in table 2-1.

Input (DTE) Broadcast	Output (DCE) Group
TEST SET x I	ITU-xx (UST Interfaces)
* PTCHxx-I	ITU-xx (BDF Interfaces)

* Manual patches will be required in the Wideband Patchbay (WBPB) to connect the output of the Data Block Emulator (DBE) Send Data Unit (SDU) to the selected wideband patch, then subsequently make the CDSS connection noted above to connect the patch to the ITU under test.

2. Comm Control confirm that the ITU that is under test is enabled and configured per the parameters listed in table 2-1.

* Note: Refer to the specific worksheet for a given ITU to determine which networks and stations are required for testing.

3. Comm Control confirm with CD Manager the logical port address and configuration of the JSC MDM interface under test. Confirm the applicable network and station is configured to receive the BERT from us via the IONET.

4. Comm Control seek confirmation from the applicable network and station that they are locked up error free to the BERT we are transmitting to them via the IONET. Once confirmation has been received, allow the test to run for 15 minutes. Pass / Fail criteria is based on specifications for Type I interfaces outlined in NASA Communications (NASCOM) Operating Procedures(NASCOP) Volume 2, Revision 2, September 1996, Section 5.10 "Proof of Performance". The interface should achieve a minimum of 99.5% error free throughput with no resync's detected by the receiving test set.

5. After 15 minutes request from the applicable network and station the results of the test. Annotate the results on the worksheet provided for the ITU under test in the category "IONET Interface Multiplexer "A" Carrier Clock" / "Station Name".

6. Repeat steps 1 through 5 for each of the ITU's identified in table 2-1.

7. Verify the capability to disable the output of Multiplexer "A" to the IONET utilizing the HP OpenView MIB Browser.

8. Verify the capability to enable the output of Multiplexer "A" to the IONET utilizing the HP OpenView MIB Browser.

9. Proceed to the Output Terminal Unit (OTU) portion of the test.

Table 2-1

JSC IONET TRANSMIT TO NASCOM / MULTIPLEXER "A"
COMMON CARRIER CLOCK
GN / RTS / DSN INTERFACES

ITU	PA	CHID	CONFIGURATION			MSG TYPE	DESCRIPTION
17	0117		192K	TT	UST	19	OD DATA
22	0122		56K	TT	BDF	19	CAS-1: PDIS FEP / CAS
25	0125		56K	TT	BDF	19	CKT SW I/F VECTORS TO OAFB
26	0126		9.6K	TT	UST	19	FLIGHT PLANNING SYSTEM
32	0182	A1	72K	TT	UST	19	KSAF THROUGHPUT TO GN / RTS
33	0183		56K	TT	BDF	19	PAY-1: PDIS (MISSION UNIQUE)
34	0184		56K	TT	BDF	19	PAY-2: PDIS (MISSION UNIQUE)
35	0185		56K	TT	BDF	19	PAY-3: PDIS (MISSION UNIQUE)
37	0187		128K	TT	UST	19	MSFC PLAYBACK
38	0188		19.2K	TT	BDF	19	SLS DATA TO MSFC
39	0189		56K	TT	BDF	19	JSC-4: USER PLANNING SYSTEM

E.2.4 Output Terminal Unit (OTU) Test

1. Comm Control ensure the following connections are made in the CDSS to configure a Data Transmission Test Sets to the OTU's under test. The Data Transmission Test Set should be configured to receive a nominal 2047 pattern with the block size set to 4800 bits. Please use the Broadcast to Port method of connection in the CDSS when connecting the test sets to the OTU's. Note the OTU's that are required to be checked out are listed in table 2-2.

Input (DTE) Broadcast	Output (DCE) Port
OTU-xx-A1	TEST SET x O (UST Interfaces) or * PTCHxx-O (BDF Interfaces)
OTU-xx-A2	TEST SET x O (UST Interfaces) or * PTCHxx-O (BDF Interfaces)

* Manual patches will be required in the Wideband Patchbay (WBPB) to connect the selected wideband patch to the input of the Data Block Emulator (DBE) Receive Data Unit (RDU), then subsequently make the CDSS connection noted above to connect the OTU under test to the selected wideband patch.

2. Comm Control confirm that the OTU's that are under test are enabled and configured per the parameters listed in table 2-2.

3. Comm Control confirm with CD Manager the logical port address and configuration of the JSC MDM interface under test. Confirm the applicable network and station is configured to transmit a BERT to JSC via the IONET on the interface identified for test.

4. Comm Control notify the applicable network and station that you are locked up error free to the BERT they are transmitting to us via the IONET. Once confirmation has been provided to the applicable network and station, allow both tests to run for 15 minutes. Pass / Fail criteria is based on specifications for Type I interfaces outlined in NASA Communications (NASCOM) Operating Procedures(NASCOP) Volume 2, Revision 2, September 1996, Section 5.10 "Proof of Performance". The interface should achieve a minimum of 99.5% error free throughput with no resync's detected by the receiving test set.

5. After 15 minutes notify the applicable network and station to report the results of the test. Annotate the results on the worksheet provided for the OTU's under test in the category "IONET Interface xxxx " / "Station Name" for OTU-yy-A1 and OTU-yy-A2.
   xxxx = the name of the network and station under test
   yy = the physical number of the OTU under test

6. Repeat steps 1 through 5 for each pair of the OTU's identified in table 2-2.

Table 2-2

DATA RECEIVED FROM GSFC VIA IONET / DEMULTIPLEXER'S "A1" & "A2"

GN / RTS /DSN INTERFACES

OTU		PA		CONFIGURATION			DESCRIPTION
12		0174		32/72K	IC/CL	UST	JSC-6: GN / RTS COMMAND ECHO SSAF
21		0121		9.6K	IC	UST	FLIGHT PLANNING SYSTEM
25		0125		1024K	IC/TR	UST	RTS RECORDER DUMP
31		0131		192K	IC/TR	UST	RTS OD
32		0132		9.6K	IC	UST	CSS/NASCOM EVENT PRINTER
35		0135		56K	IC	BDF	JSC-4: UPS

7. End of test procedure for Test Scenario II. Please return the system under test back to its nominal support configuration. Proceed to the next test scenario.

E.3 Test Scenario III - JSC to GSFC / MSFC / GN / RTS / DSN via Ionet from MUX B Using DOMSAT clock

E.3.1 Objective

This scenario will verify the integrity of the modified MDM equipment to support the nominal interfaces utilized for Space Shuttle support between JSC and GSFC, MSFC, GN, RTS, DSN. Interfaces to be validated for this scenario include the JSC Multiplexer "B" transmit capability to GSFC, MSFC, GN, RTS and DSN via the IONET and where applicable the integrity of the IONET to NASCOM 2000 interface. JSC will utilize the Alternate Broadcast Common Carrier Clock to provide timing (2.5MB) for Multiplexer "B".

E.3.2 System Configuration

1. Comm Control ensure the following connections are made in the CDSS to place the MDM into the configuration needed for this test scenario. Please use the Broadcast to Port method of connection in the CDSS.

Input (DTE) Broadcast	Output (DCE) Port
BCLKA	MUX-B-T
MUX-B	MUX-B-NLIC

**** Warning do not connect both multiplexers to the IONET simultaneously ****

Ensure that multiplexer "A" output is disabled from the IONET by utilizing either the method the disconnects the CDSS switch path "null to MUX-A-NLIC" or disabling multiplexer "A" output utilizing the HP OpenView MIB Browser.

E.3.3 Input Terminal Unit (ITU) Test

Follow **Steps 1-8** in **E.2.3** procedures.

9. End of test procedure for Test Scenario III. Please return the system under test back to its nominal support configuration. Proceed to the next test scenario.

E.4 Test Scenario IV - JSC to GSFC / MSFC / GN / RTS / DSN via IOnet from MUX A using NLIC clock

E.4.1 Objective

This scenario will verify the integrity of the modified MDM equipment to support the nominal interfaces utilized for Space Shuttle support between JSC and GSFC, MSFC, GN, RTS, DSN. Interfaces to be validated for this scenario include the JSC Multiplexer "A" transmit capability to GSFC, MSFC, GN, RTS and DSN via the IONET and where applicable the integrity of the IONET to NASCOM 2000 interface JSC will utilize the NLIC Clock to provide timing (10MB) for Multiplexer "A".

E.4.2 System Configuration

1. Comm Control ensure the following connections are made in the CDSS to place the MDM into the configuration needed for this test scenario. Please use the Broadcast to Port method of connection in the CDSS and make the connections in the exact order they are listed:

Input (DTE) Broadcast	Output (DCE) Port
NULL	BCTP
MUX-A-NLIC-T	MUX-A-T
MUX-A	MUX-A-NLIC

**** Warning: The CDSS connection from multiplexer "A" to the Prime Broadcast Link must be disconnected prior to connection of the NLIC (10MB) clock to multiplexer "A".**

**** Warning: Do not connect both multiplexers to the IONET simultaneously ****

**** Warning: Ensure that multiplexer "B" output is disabled from the IONET by utilizing either the method that disconnects the CDSS switch path "null to MUX-B-NLIC" or disabling multiplexer "B" output utilizing the HP OpenView MIB Browser.**

E.4.3 Input Terminal Unit (ITU) Test

Follow **Steps 1-9** in **E.2.3** procedures.

E.4.4 Output Terminal Unit (OTU) Test

Follow **Steps 1-6** in **E.2.4** procedures.

7. End of test procedure for Test Scenario IV. Please return the system under test back to its nominal support configuration. Proceed to the next test scenario.

E.5 Test Scenario V - JSC to GSFC / MSFC / GN / RTS / DSN via IOnet with MUX B and NLIC clock

E.5.1 Objective

This scenario will verify the integrity of the modified MDM equipment to support the nominal interfaces utilized for Space Shuttle support between JSC and GSFC, MSFC, GN, RTS DSN. Interfaces to be validated for this scenario include the JSC Multiplexer "B" transmit capability to GSFC, MSFC, GN, RTS and DSN via the IONET and where applicable the integrity of the IONET to NASCOM 2000 interface. JSC will utilize the NLIC Clock to provide timing (10MB) for Multiplexer "B".

E.5.2 System Configuration

1. Comm Control ensure the following connections are made in the CDSS to place the MDM into the configuration needed for this test scenario. Please use the Broadcast to Port method of connection in the CDSS and make the connections in the exact order they are listed:

Input (DTE) Broadcast	Output (DCE) Port
NULL	BCTA
MUX-B-NLIC-T	MUX-B-T
MUX-B	MUX-B-NLIC

**** Warning: The CDSS connection from multiplexer "B" to the Alternate Broadcast Link must be disconnected prior to connection of the NLIC (10MB) clock to multiplexer "B".**

**** Warning: Do not connect both multiplexers to the IONET simultaneously ****

**** Warning: Ensure that multiplexer "A" output is disabled from the IONET by utilizing either the method the disconnects the CDSS switch path "null to MUX-A-NLIC" or disabling multiplexer "A" output utilizing the HP OpenView MIB Browser.**

E.5.3 Input Terminal Unit (ITU) Test

Follow **Steps 1-8** in **E.2.3** procedures.

9. End of test procedure for Test Scenario V. Please return the system under test back to its nominal support configuration. Proceed to the next test scenario.

Appendix F - JSC/WSC Preliminary Test Scenarios I-V

F.1 Test Scenario I - Verify JSC/WSC Domsat Interfaces

F.1.1 Objective

This scenario will verify the integrity of the modified MDM equipment to support the nominal interfaces utilized for Space Shuttle support between JSC and WSC (WSGT & STGT). Interfaces to be validated for this scenario include the JSC DOMSAT (Prime and Alternate Broadcast Systems) and WSC (Prime and Alternate Broadcast Systems). JSC will utilize the Prime Broadcast Common Carrier Clock to provide timing (2.5MB) for Multiplexer "A" and the Alternate Broadcast Common Carrier Clock to provide timing (2.5MB) for Multiplexer "B".

F.1.2 System Configuration

1. Comm Control ensure the following connections are made in the CDSS to place the MDM into the configuration needed for this test scenario. Please use the Broadcast to Port method of connection in the CDSS.

Input (DTE) Broadcast	Output (DCE) Port
BCLKP	MUX-A-T
BCLKA	MUX-B-T
MUX-A	BCTP
MUX-B	BCTA
WSCP	DMUXB1
WSCA	DMUXB2

F.1.3 Input Terminal Unit (ITU) Test

1. Comm Control ensure the following connections are made in the CDSS to configure a Data Transmission Test Set to the ITU under test. The Data Transmission Test Set should output the nominal 2047 pattern at the appropriate rate for a given interface. Please use the Broadcast to Group method of connection in the CDSS when

connecting the test set to the ITU. Note the ITU's that are required to be checked out are listed in table 1-1.

Input (DTE) Broadcast	Output (DCE) Group
TEST SET x I	ITU-xx (UST Interfaces)

2. Comm Control confirm that the ITU that is under test is enabled and configured per the parameters listed in table 1-1.

3. Comm Control confirm with the applicable ground terminal (WSGT or STGT) the port address and configuration of the MDM interface under test. Confirm with the applicable ground terminal (WSGT or STGT) is configured to receive the BERT from us via the JSC Prime Broadcast Signal.

4. Comm Control seek confirmation from the applicable ground terminal (WSGT or STGT) that they are locked up error free to the BERT we are transmitting to them via the JSC Prime Broadcast. Once confirmation has been received, allow the test to run for five minutes. Pass / Fail criteria is based on specifications for Type I interfaces outlined in NASA Communications (NASCOM) Operating Procedures(NASCOP) Volume 2, Revision 2, September 1996, Section 5.10 "Proof of Performance". The interface should achieve a minimum of 99.5% error free throughput with no resync's detected by the receiving test set.

5. After 15 minutes request from the applicable ground terminal (WSGT or STGT) the results of the test. Annotate the results on the worksheet provided for the ITU under test in the category "DOMSAT Interface Prime Broadcast".

6. Comm Control request the applicable ground terminal (WSGT or STGT) reconfigure their test equipment to receive the BERT from us via the JSC Alternate Broadcast.

7. Comm Control seek confirmation from the applicable ground terminal (WSGT or STGT) that they are locked up error free to the BERT we are transmitting to them via the JSC Alternate Broadcast. Once confirmation has been received, allow the test to run for 15 minutes. Pass / Fail criteria is based on specifications for Type I interfaces outlined in NASA Communications (NASCOM) Operating Procedures(NASCOP) Volume 2, Revision 2, September 1996, Section 5.10 "Proof of Performance". The interface should achieve a minimum of 99.5% error free throughput with no resync's detected by the receiving test set.

8. After 15 minutes request from the applicable ground terminal (WSGT or STGT) the results of the test. Annotate the results on the worksheet provided for the ITU under test in the category "DOMSAT Interface Alternate Broadcast".

9. Repeat steps 1 through 8 for each of the ITU's identified in table 1-1.

10. Proceed to the Output Terminal Unit (OTU) portion of the test.

Table 1-1

JSC PRIME AND ALTERNATE BROADCAST TO NASCOM / MULTIPLEXERS "A" & "B"

SN INTERFACES (Common Interfaces with WSGT and STGT)

ITU	PA	CHID	CONFIGURATION			MSG TYPE	DESCRIPTION
01	0401		216K	TT	UST	19	KSAF / WSC
02	0402		216K	TT	UST	19	KSAF / WSC
03	0403		72K	TT	UST	19	SSAF / WSC
04	0404		72K	TT	UST	19	SSAF / WSC

WSGT INTERFACES (Specific Interfaces with WSGT)

ITU	PA	CHID	CONFIGURATION			MSG TYPE	DESCRIPTION
11	03FF	FF	10K		BDF	19	WSGT MAINTENANCE CHANNEL

STGT INTERFACES (Specific Interfaces with STGT)

ITU	PA	CHID	CONFIGURATION			MSG TYPE	DESCRIPTION
21	02BB	BB	10K		BDF	19	STGT MAINTENANCE CHANNEL

F.1.4 Output Terminal Unit (OTU) Test

1. Comm Control ensure the following connections are made in the CDSS to configure a Data Transmission Test Sets to the OTU's under test. The Data Transmission Test Set should be configured to receive a nominal 2047 pattern with the block size set to 4800 bits. Please use the Broadcast to Port method of connection in the CDSS when connecting the test sets to the OTU's. Note the OTU's that are required to be checked out are listed below in table 1-2.

Input (DTE) Broadcast	Output (DCE) Port
OTU-xx-B1	TEST SET x O (UST Interfaces) or * PTCHxx-O (BDF Interfaces)
OTU-xx-B2	TEST SET x O (UST Interfaces) or * PTCHxx-O (BDF Interfaces)

* Manual patches will be required in the Wideband Patchbay (WBPB) to connect the selected wideband patch to the input of the Data Block Emulator (DBE) Receive Data Unit (RDU), then subsequently make the CDSS connection noted above to connect the OTU under test to the selected wideband patch.

2. Comm Control confirm that the OTU's that are under test are enabled and configured per the parameters listed in table 1-2.

3. Comm Control confirm with the applicable ground terminal (WSGT or STGT) the port address and configuration of the MDM interface under test. Confirm that the applicable ground terminal (WSGT or STGT) is configured to transmit a BERT on the MDM interface identified for test.

4. Comm Control notify the applicable ground terminal (WSGT or STGT) that you are locked up error free to the BERT they are transmitting to us via the WSC Prime and Alternate Broadcast. Once confirmation has been provided to the applicable ground terminal (WSGT or STGT), allow both tests to run for 15 minutes. Pass / Fail criteria is based on specifications for Type I interfaces outlined in NASA Communications (NASCOM) Operating Procedures(NASCOP) Volume 2, Revision 2, September 1996, Section 5.10 "Proof of Performance". The interface should achieve a minimum of 99.5% error free throughput with no resync's detected by the receiving test set.

5. After 15 minutes notify the applicable ground terminal (WSGT or STGT) to report the results of the test. Annotate the results on the worksheet provided for the OTU's under test in the category "DOMSAT Interface WSC Prime Broadcast" for OTU-xx-B1 and "DOMSAT Interface WSC Alternate Broadcast" for OTU-xx-B2.

6. Repeat steps 1 through 5 for each pair of the OTU's identified in table 1-2.

7. End of test procedure for Test Scenario I. Please return the system under test back to its nominal support configuration. Proceed to the next test scenario.

Table 1-2

DATA RECEIVED FROM WSC / DEMULTIPLEXER'S "B1" (PRIME) & "B2" (ALTERNATE)

SN INTERFACES (Common interfaces with WSGT and STGT)

OTU	PA	CONFIGURATION			DESCRIPTION
31	0231	192K	IC/TR	UST	WSC SSAR (SCID 231) TDE
32	0232	192K	IC/TR	UST	WSC KSAR CH1 (SCID 232) TDE
33	0233	1024K 2MB	IC/TR	UST	WSC KSAR CH2 (SCID 233) TDE
34	0234	2M	IC/TR	UST	WSC KSAR CH3 (SCID TBS) TDE
35	0235	192K	IC/TR	UST	WSC SSAR (SCID 235) TDW
36	0236	192K	IC/TR	UST	WSC KSAR CH1 (SCID 236) TDW
37	0237	1024K 2MB	IC/TR	UST	WSC KSAR CH2 (SCID 237) TDW
38	0238	2M	IC/TR	UST	WSC KSAR CH3 (SCID TBS) TDW

SN INTERFACES (Specific Interfaces with WSGT)

OTU	PA	CONFIGURATION			DESCRIPTION
07	0367	32/72K	IC/CL	UST	**WSGT** S-BAND COMMAND ECHO
08	0368	72/216K	IC/CL	UST	**WSGT** K-BAND COMMAND ECHO
09	0369	96K-2M	IC/TR	UST	**WSGT** PLAYBACK TYPE 1 DATA
10	0370	56K	IC	BDF	**WSGT** TDRS TRACKING DATA
11	03FF	9.6K	IC	UST	**WSGT** MAINTENANCE CHANNEL

SN INTERFACES (Specific Interfaces with STGT)

OTU	PA	CONFIGURATION			DESCRIPTION
17	0267	32/72K	IC/CL	UST	**STGT** S-BAND COMMAND ECHO
18	0268	72/216K	IC/CL	UST	**STGT** K-BAND COMMAND ECHO
19	0269	96K-2M	IC/TR	UST	**STGT** PLAYBACK TYPE 1 DATA
20	0270	56K	IC	BDF	**STGT** TDRS TRACKING DATA
21	02BB	9.6K	IC	UST	**STGT** MAINTENANCE CHANNEL

F.2 WSC Test Scenario II - IOnet with DOMSAT Clock JSC MUX A to WSC and WSC to DEMUX B1 and B2

F.2.1 Objective

This scenario will verify the integrity of the modified MDM equipment to support the nominal SN interfaces utilized for Space Shuttle support between JSC and WSC. Interfaces to be validated for this scenario include the JSC Multiplexer "A" transmit capability to WSC (WSGT and STGT) via the IONET and the capability to receive from WSC (WSGT and STGT) via the IONET utilizing Demultiplexers "B1" and "B2". JSC will utilize the Prime Broadcast Common Carrier Clock to provide timing (2.5MB) for Multiplexer "A".

F.2.2 System Configuration

1. Comm Control ensure the following connections are made in the CDSS to place the MDM into the configuration needed for this test scenario. Please use the Broadcast to Port method of connection in the CDSS.

Input (DTE) Broadcast	Output (DCE) Port
BCLKP	MUX-A-T
MUX-A	MUX-A-NLIC
DMUX-A1-NLIC	DMUXA1
DMUX-A2-NLIC	DMUXA2

****Warning do not connect both multiplexers to the IONET simultaneously**

F.2.3 Input Terminal Unit (ITU) Test

1. Comm Control ensure the following connections are made in the CDSS to configure a Data Transmission Test Set to the ITU under test. The Data Transmission Test Set should output the nominal 2047 pattern at the appropriate rate for a given interface. Please use the Broadcast to Group method of connection in the CDSS when connecting the test set to the ITU. Note the ITU's that are required to be checked out are listed in table 2-1.

Input (DTE) Broadcast	Output (DCE) Group
TEST SET x I	ITU-xx (UST Interfaces)

2. Comm Control confirm that the ITU that is under test is enabled and configured per the parameters listed in table 2-1.

3. Comm Control confirm with the applicable ground terminal (WSGT or STGT) the port address and configuration of the MDM interface under test. Confirm with the applicable ground terminal (WSGT or STGT) is configured to receive the BERT from us via the IONET.

4. Comm Control seek confirmation from the applicable ground terminal (WSGT or STGT) that they are locked up error free to the BERT we are transmitting to them via the IONET. Once confirmation has been received, allow the test to run for 15 minutes. Pass / Fail criteria is based on specifications for Type I interfaces outlined in NASA Communications (NASCOM) Operating Procedures(NASCOP) Volume 2, Revision 2, September 1996, Section 5.10 "Proof of Performance". The interface should achieve a minimum of 99.5% error free throughput with no resync's detected by the receiving test set.

5. After 15 minutes request from the applicable ground terminal (WSGT or STGT) the results of the test. Annotate the results on the worksheet provided for the ITU under test in the category "IONET Interface Multiplexer "A" Carrier Clock".

6. Repeat steps 1 through 5 for each of the ITU's identified in table 2-1.

7. Proceed to the Output Terminal Unit (OTU) portion of the test.

Table 2-1

JSC IONET TRANSMIT TO WSC / MULTIPLEXER "A"

SN INTERFACES (Common Interfaces with WSGT and STGT)

ITU	PA	CHID	CONFIGURATION			MSG TYPE	DESCRIPTION
01	0401		216K	TT	UST	19	KSAF / WSC
02	0402		216K	TT	UST	19	KSAF / WSC
03	0403		72K	TT	UST	19	SSAF / WSC
04	0404		72K	TT	UST	19	SSAF / WSC

SN INTERFACES (Specific Interfaces with WSGT)

ITU	PA	CHID	CONFIGURATION			MSG TYPE	DESCRIPTION
11	03FF	FF	9.6K		UST	19	WSGT MAINTENANCE CHANNEL

SN INTERFACES (Specific Interfaces with STGT)

ITU	PA	CHID	CONFIGURATION			MSG TYPE	DESCRIPTION
21	02BB	BB	9.6K		UST	19	STGT MAINTENANCE CHANNEL

F.2.4 Output Terminal Unit (OTU) Test

1. Comm Control ensure the following connections are made in the CDSS to configure a Data Transmission Test Sets to the OTU's under test. The Data Transmission Test Set should be configured to receive a nominal 2047 pattern with the block size set to 4800 bits. Please use the Broadcast to Port method of connection in the CDSS when connecting the test sets to the OTU's. Note the OTU's that are required to be checked out are listed below in table 2-2.

Input (DTE) Broadcast	Output (DCE) Port
OTU-xx-B1 (BDF Interfaces)	TEST SET x O (UST Interfaces) or * PTCHxx-O
OTU-xx-B2 (BDF Interfaces)	TEST SET x O (UST Interfaces) or * PTCHxx-O

* Manual patches will be required in the Wideband Patchbay (WBPB) to connect the selected wideband patch to the input of the Data Block Emulator (DBE) Receive Data Unit (RDU), then subsequently make the CDSS connection noted above to connect the OTU under test to the selected wideband patch.

2. Comm Control confirm that the OTU's that are under test are enabled and configured per the parameters listed in table 2-2.

3. Comm Control confirm with the applicable ground terminal (WSGT or STGT) the port address and configuration of the MDM interface under test. Confirm that the applicable ground terminal (WSGT or STGT) is configured to transmit a BERT on the MDM interface identified for test.

4. Comm Control notify the applicable ground terminal (WSGT or STGT) that you are locked up error free to the BERT they are transmitting to us via the IONET. Once confirmation has been provided to the applicable ground terminal (WSGT or STGT), allow both tests to run for 15 minutes. Pass / Fail criteria is based on specifications for Type I interfaces outlined in NASA Communications (NASCOM) Operating Procedures(NASCOP) Volume 2, Revision 2, September 1996, Section 5.10 "Proof of Performance". The interface should achieve a minimum of 99.5% error free throughput with no resync's detected by the receiving test set.

5. After 15 minutes notify the applicable ground terminal (WSGT or STGT) to report the results of the test. Annotate the results on the worksheet provided for the OTU's under test in the category "IONET Interface GSFC " for OTU-xx-B1 and OTU-xx-B2.

6. Repeat steps 1 through 5 for each pair of the OTU's identified in table 2-2.

7. End of test procedure for Test Scenario II. Please return the system under test back to its nominal support configuration. Proceed to the next test scenario.

Table 2-2

DATA RECEIVED FROM WSC VIA IONET / DEMULTIPLEXER'S "B1" & "B2"

SN INTERFACES (Common interfaces with WSGT and STGT)

OTU	PA	CONFIGURATION			DESCRIPTION
31	0231	192K	IC/TR	UST	WSC SSAR (SCID 231) TDE
32	0232	192K	IC/TR	UST	WSC KSAR CH1 (SCID 232) TDE
33	0233	1024K	IC/TR	UST	WSC KSAR CH2 (SCID 233) TDE
34	0234	2M	IC/TR	UST	WSC KSAR CH3 (SCID TBS) TDE
35	0235	192K	IC/TR	UST	WSC SSAR (SCID 235) TDW
36	0236	192K	IC/TR	UST	WSC KSAR CH1 (SCID 236) TDW
37	0237	1024K	IC/TR	UST	WSC KSAR CH2 (SCID 237) TDW
38	0238	2M	IC/TR	UST	WSC KSAR CH3 (SCID TBS) TDW

SN INTERFACES (Specific Interfaces with WSGT)

OTU	PA	CONFIGURATION			DESCRIPTION
07	0367	32/72K	IC/CL	UST	**WSGT** S-BAND COMMAND ECHO
08	0368	72/216K	IC/CL	UST	**WSGT** K-BAND COMMAND ECHO
09	0369	96K-2M	IC/TR	UST	**WSGT** PLAYBACK TYPE 1 DATA
10	0370	56K	IC	BDF	**WSGT** TDRS TRACKING DATA
11	03FF	9.6K	IC	UST	**WSGT** MAINTENANCE CHANNEL

SN INTERFACES (Specific Interfaces with STGT)

OTU	PA	CONFIGURATION			DESCRIPTION
17	0267	32/72K	IC/CL	UST	**STGT** S-BAND COMMAND ECHO
18	0268	72/216K	IC/CL	UST	**STGT** K-BAND COMMAND ECHO
19	0269	96K-2M	IC/TR	UST	**STGT** PLAYBACK TYPE 1 DATA
20	0270	56K	IC	BDF	**STGT** TDRS TRACKING DATA
21	02BB	9.6K	IC	UST	**STGT** MAINTENANCE CHANNEL

F.3 WSC Test Scenario III - IOnet with DOMSAT Clock JSC MUX B to WSC

F.3.1 Objective

This scenario will verify the integrity of the modified MDM equipment to support the nominal interfaces utilized for Space Shuttle support between JSC and WSC. Interfaces to be validated for this scenario include the JSC Multiplexer "B" transmit capability to WSC (WSGT and STGT) via the IONET. JSC will utilize the Alternate Broadcast Common Carrier Clock to provide timing (2.5MB) for Multiplexer "B".

F.3.2 System Configuration

1. Comm Control ensure the following connections are made in the CDSS to place the MDM into the configuration needed for this test scenario. Please use the Broadcast to Port method of connection in the CDSS.

Input (DTE) Broadcast	Output (DCE) Port
BCLKA	MUX-B-T
MUX-B	MUX-B-NLIC

**** Warning do not connect both multiplexers to the IONET simultaneously ****

Ensure that multiplexer "A" output is disabled from the IONET by utilizing either the method that disconnects the CDSS switch path "null to MUX_A_NLIC" or disabling multiplexer "A" output utilizing the HP OpenView MIB Browser.

F. 3.3 Input Terminal Unit (ITU) Test

Follow **Steps 1-6** in **F.2.3** procedures.

7. End of test procedure for Test Scenario III. Please return the system under test back to its nominal support configuration. Proceed to the next test scenario.

F.4 WSC Test Scenario IV - IOnet with NLIC Clock JSC MUX A to WSC

F.4.1 Objective:

This scenario will verify the integrity of the modified MDM equipment to support the nominal interfaces utilized for Space Shuttle support between JSC and WSC. Interfaces to be validated for this scenario include the JSC Multiplexer "A" transmit capability to WSC (WSGT and STGT) via the IONET. JSC will utilize the NLIC Clock to provide timing (10MB) for Multiplexer "A".

F.4.2 System Configuration

1. Comm Control ensure the following connections are made in the CDSS to place the MDM into the configuration needed for this test scenario. Please use the Broadcast to Port method of connection in the CDSS and make the connections in the exact order they are listed:

Input (DTE) Broadcast	Output (DCE) Port
NULL	BCTP
MUX-A-NLIC-T	MUX-A-T
MUX-A	MUX-A-NLIC

**** Warning: The CDSS connection form multiplexer "A" to the Prime Broadcast Link must be disconnected prior to connection of the NLIC (10MB) clock to multiplexer "A".**

**** Warning: Do not connect both multiplexers to the IONET simultaneously**

**** Warning: Ensure multiplexer "B" output is disabled from the IONET by utilizing either the method that disconnects the CDSS switch path "null to MUX-B-NLIC" or disabling multiplexer "B" output utilizing the HP OpenView MIB Browser.**

F.4.3 Input Terminal Unit (ITU) Test

Follow **procedures 1-6 in F.2.3 .**

7. End of test procedure. Please return the system under test back to its nominal support configuration. Proceed to the next test scenario.

F.5 WSC Test Scenario V - IOnet with NLIC Clock JSC MUX B to WSC

F.5.1 Objective:

This scenario will verify the integrity of the modified MDM equipment to support the nominal interfaces utilized for Space Shuttle support between JSC and WSC. Interfaces to be validated for this scenario include the JSC Multiplexer "B" transmit capability to WSC (WSGT and STGT) via the IONET. JSC will utilize the NLIC Clock to provide timing (10MB) for Multiplexer "B".

F.5.2 System Configuration

1. Comm Control ensure the following connections are made in the CDSS to place the MDM into the configuration needed for this test scenario. Please use the Broadcast to Port method of connection in the CDSS and make the connections in the exact order they are listed:

Input (DTE) Broadcast	Output (DCE) Port
MUX-B-NLIC-T	MUX-B-T
MUX-B	MUX-B-NLIC

**** Warning: The CDSS connection from multiplexer "B" to the Alternate Broadcast Link must be disconnected prior to connection of the NLIC (10MB) clock to multiplexer "B". ****

**** Warning: Do not connect both multiplexers to the IONET simultaneously ****

**** Warning: Ensure multiplexer "A" output is disabled from the IONET by utilizing either the method that disconnects the CDSS switch path "null to MUX-A-NLIC" or disabling multiplexer "A" output utilizing the HP OpenView MIB Browser.**

F.5.3 Input Terminal Unit (ITU) Test

Follow **procedures 1-7 in F.4.3 .**

END OF PROCEDURE F

Appendix G - Modified MDM IP Integration Tests

G.1 STGT/JSC Modified MDM IP Integration Test Procedures

When: **Wednesday, June 18 10:00 - 13:00, 15:00 - 17:00 EDT**

Participants: **NOC** **301-286-0035, 0920 Voice: GSFC SCAMA 56**
CD Mgmt **301-286-3608, 474-3785 Voice: GSFC SCAMA 56**
IP Test Team **301-286-4458, 2514 Voice: GSFC SCAMA 56**
STGT Operations **505-527-7177**

Objective: Testing the STGT MDM modifications in order to:
- verify that the NOC can configure the MUX and DEMUX mapping tables
- verify that the NOC can status the MUX and DEMUX MIB settings
- verify data flow from an STGT ITU to a GSFC Conversion Device at various data rates
- verify data flow from a Conversion Device to an STGT and JSC OTU at various data rates using both loopback and SCD and PTP data generating tools
- verify data flow from an STGT ITU to a JSC OTU
- verify data flow from a JSC ITU to an STGT OTU
- verify that the NOC receives traps when errors occur

Configuration:

MUXs: At both STGT and JSC, a local hardware switch is used to determine whether data is sent to the NLIC in addition to the data being sent via legacy DOMSAT. Since the decision is being made in the hardware, for now the MIB variable "mdmDataFlow" should be set to "enabled" in all MUXes at all sites. Only one MUX at each site should have this switch turned on or duplicate data will reach the IONET. Preferably this is whichever MUX is currently the alternate MUX, but there should be no operational impact if the prime MUX is used.

DEMUXes: A local hardware switch is also used for DEMUXes. Similarly, the MIB variable "mdmDemuxInSelect" should be set to "NLIC" in all DEMUX NLICs. The hardware switch then determines whether the NLIC data or the DOMSAT data is passed to the DEMUX. Only the alternate DEMUX should have the hardware switch turned on, as using the prime DEMUX could impact operations depending upon which logical port numbers are used.

MDM devices for this test consists of one MUX and one DEMUX at STGT, and one MUX and two DEMUXes (A & B) at JSC.

There will be one SCD and two PTP conversion devices made available for testing: TSCD-1, TPTP-1, and E171A-9. The SCD software version is R3.0f, the PTP software version is 4.05.03.

Note: JSC has an IP load test using their PTPs scheduled for 11:30 to 16:00 Wednesday. During this time, the JSC DEMUXes may need to be disabled via the NLIC in order to stop all IP traffic on their portion of the network. For most of the following tests, JSC participation is optional and there will be no impact. Tests 5 and 6 require JSC participation and will be scheduled around the JSC test time.

G.2 TEST 1

Objective: Verify that the NOC can configure and verify the MUX and DEMUX MIB variables.

Case 1: Configure the MUX mapping tables from the NOC.

Procedures: The NOC should contact Houston Comm Control and STGT Operations via the Nascom Comm Manager to verify the release of the current alternate MDMs. They should then configure the MUXes' mapping tables using SNMP set commands. The NOC should then verify the tables using SNMP get commands.

Expected Results: The MUX mapping tables should contain the following LPA, Multicast address and UDP port information:

MUX	LPA	Multicast Xmit	UDP port	Rate
STGT	501	225.2.0.201	8201	50 kbps MDM Test Data
STGT	502	225.2.0.202	8202	1.544 Mbps BERT data
STGT	503	225.2.0.203	8203	50 kbps MDM Test Data
STGT	504	225.2.0.204	8204	1.544 Mbps BERT data
STGT	505	225.2.0.205	8205	spare
STGT	508	225.2.0.8	10508	50 kbps MDM Test Data
STGT	509	225.2.0.9	10509	1.544 Mbps BERT data
JSC	506	225.2.0.6	10506	50 kbps MDM Test Data
JSC	507	225.2.0.7	10507	1.544 Mbps BERT data

Actual Results:

Case 2: Configure the DEMUX mapping tables from the NOC.

Procedures: The NOC should configure the DEMUXes' mapping tables using SNMP set commands. The NOC should then verify the tables using SNMP get commands.

Expected Results: The DEMUXes' mapping tables should contain the LPAs, Multicast addresses, UDP ports, source addresses, and masks from the following table:

DEMUX	LPA	Multicast Rx	UDP	Source Address	mask	Source	Rate
STGT	501	225.2.0.1	10501	150.144.180.245	255.255.255.255	TPTP-1 (loopbk) *	50 kbps
STGT	502	225.2.0.2	10502	150.144.181.53	255.255.255.255	E171-9 (loopbk) *	1.544 Mbps
STGT	503	225.2.0.3	10503	150.144.180.243	255.255.255.255	TSCD-1 (SCD)	50 kbps
STGT	504	225.2.0.4	10504	150.144.180.243	255.255.255.255	TSCD-1 (SCD)	1.544 Mbps
STGT	505	225.2.0.5	10505	150.144.184.231	255.255.255.255	LSAT45-3	spare
STGT	506	225.2.0.6	10506	150.144.187.32	255.255.255.255	JSC ITU	50 kbps
STGT	507	225.2.0.7	10507	150.144.187.32	255.255.255.255	JSC ITU	1.544 Mbps
JSC A & B	501	225.2.0.1	10501	150.144.180.245	255.255.255.255	TPTP-1 (loopbk) *	50 kbps
JSC A & B	502	225.2.0.2	10502	150.144.181.53	255.255.255.255	E171-9 (loopbk) *	1.544 Mbps
JSC A & B	503	225.2.0.3	10503	150.144.180.243	255.255.255.255	TSCD-1 (SCD)	50 kbps
JSC A & B	504	225.2.0.4	10504	150.144.180.243	255.255.255.255	TSCD-1 (SCD)	1.544 Mbps
JSC A & B	508	225.2.0.8	10508	150.144.189.58	255.255.255.255	STGT ITU	50 kbps
JSC A & B	509	225.2.0.9	10509	150.144.189.58	255.255.255.255	STGT ITU	1.544 Mbps

* In Test 4, data will be looped back. In Test 8, data will be generated by the PTP.
Actual Results:

Case 3: Configure the MDMs to send traps to the NOC.

Procedures: The NOC should configure the MDMs to send any traps which occur during testing to the NOC. Note that the traps will need to be enabled anytime the NLIC is reset.

Expected Results: The MDMs should be configured to send traps to the NOC.

Actual Results:

G.3 TEST 2

Objective: NOC verification of MIB variables in both the MUX and DEMUXes.

Case 1: Verify the settings of MIB variables in the STGT and JSC MUXes.

Procedures: The NOC should check and verify all MIB variables in the MUXes. In particular, verify that mdmDataFlow is enabled (1) to allow data to be transmitted via IP.

Expected Results: MIB variables should be correct.

Actual Results:

Case 2: Verify the settings of MIB variables in the STGT and JSC DEMUXes.

Procedures: Request that the NOC check and verify all MIB variables in the STGT DEMUX and in the JSCD A and B DEMUXes. In particular, verify that mdmDemuxInSelect is set to nlic (2) to allow IP data to be received.

Expected Results: MIB variables should be correct.

Actual Results:

G.4 TEST 3

Objective: Verify data flow from an ITU to a Conversion Device at various data rates.

Case 1: Transmit MDM data from ITU 501 to TPTP-1 at 50 kbps.

Procedures: Set up PTP-1 to listen to multicast address 225.2.0.201, port 8201, and to transmit the data out serial port 1 at 50 kbps.
Transmit data from ITU 501 at 50 kbps. Let test run for at least 5 minutes. Repeat.

Expected Results: PTP-1 should receive the data without errors. Block counts should show no missing, duplicate, or out of sequence blocks.

Actual Results:

Case 2: Transmit blocked data from ITU 502 to E171-9 at 1.544 Mbps.

Procedures: Set up E171-9 to listen to multicast address 225.2.0.202, port 8202 at 1.544 Mbps and to transmit the data out serial port 1 at 1.544 Mbps. Contact Tech Control to analyze the data.
Note: Tech Control will record errors on the line if there is clock but no data, so Tech Control should be contacted both when the data starts being transmitted and when it stops.

Transmit data from ITU 502 at 1.544 Mbps. Let test run for at least 5 minutes. Repeat.

Expected Results: E171-9 and Tech Control should receive the data without errors. Block counts should show no missing, duplicate, or out-of-sequence blocks. Contents of the block should be analyzed and verified to the extent that the information is available.

Actual Results:

G.5 TEST 4

Objective: Verify data flow from a Conversion Device to an OTU at both JSC and STGT at various data rates.
Data source: MUX data looped back via the PTP's internal loopback capability

Case 1: Transmit data from ITU 501 to PTP-1 to OTU 501 at 50 kbps.

Procedures: PTP-1 should still be configured as described in Test 3, Case1. It should be modified to internally loop back the data from the serial side to the IP side to multicast address 225.2.0.1, port 10501.
Repeat the data flow described in Test 3, Case 1, to send data from ITU 501 to PTP-1. Let test run for at least 5 minutes. Repeat.

Expected Results: OTU logical port 501 should receive the data without errors on all three DEMUXes. Block counts should show no missing, duplicate, or out of sequence blocks. Contents of the block should be analyzed and verified to the extent that the information is available.

Actual Results:

Case 2: Transmit data from ITU 502 to E171-9 to OTU 502 at 1.544 Mbps.

Procedures: E171-9 should still be configured as described in Test 3, Case 2. It should be modified to internally loop back the data from the serial side to the IP side to multicast address 225.2.0.2, port 10502.
Repeat the data flow described in Test 3, Case 2, to send data from ITU 502 to E171-9. Let test run for at least 5 minutes. Repeat.

Expected Results: OTU logical port 502 on all DEMUXes should receive the data without errors. Block counts should show no missing, duplicate, or out of sequence blocks. Contents of the block should be analyzed and verified to the extent that the information is available.

Actual Results:

G.6 TEST 5

Objective: Verify data flow from STGT MUX to JSC DEMUXes

Case 1: Transmit MDM test data from STGT ITU 508 to JSC OTUs 508 at 50 kbps.

Procedures: Transmit data from STGT ITU 508 at 50 kbps. Let test run for at least 5 minutes. Repeat.

Expected Results: JSC OTUs 508 on DEMUXes A and B should receive the data without errors. Block counts should show no missing, duplicate, or out of sequence blocks.

Actual Results:

Case 2: Transmit BERT data from STGT ITU 509 to JSC OTUs 509 at 1.544 Mbps.

Procedures: Transmit BERT data from STGT ITU 509 at 1.544 Mbps. Let test run for at least 5 minutes. Repeat.

Expected Results: JSC OTUs 509 on DEMUXes A and B should receive the data without errors. Block counts should show no missing, duplicate, or out of sequence blocks.

Actual Results:

G.7 TEST 6

Objective: Verify data flow from JSC MUX to STGT DEMUX

Case 1: Transmit MDM data from JSC ITU 506 to STGT OTU 506 at 50 kbps.

Procedures: Transmit MDM test data from JSC ITU 506 at 50 kbps. Let test run for at least 5 minutes. Repeat.

Expected Results: STGT OTU 506 should receive the data without errors. Block counts should show no missing, duplicate, or out of sequence blocks.

Actual Results:

Case 2: Transmit BERT data from JSC ITU 507 to STGT OTU 507 at 1.544 Mbps.

Procedures: Transmit BERT data from JSC ITU 507 at 1.544 Mbps. Let test run for at least 5 minutes. Repeat.

Expected Results: STGT OTU 507 should receive the data without errors. Block counts should show no missing, duplicate, or out of sequence blocks.

Actual Results:

G.8 TEST 7

Objective: Verify data flow of SCD generated test data to the DEMUXes at various data rates.

Case 1: Transmit data to both JSC and STGT's OTU 503 from TSCD-1 using mc_test at 50 kpbs.

Procedures: Logon to TSCD-1 as scdtest. Send data to OTU 503 at 50 kbps using mc_test:

```
mc_test  -a  225.2.0.3  -p  10503  -r  50  -b  10/20/15/ab  -s 100  -n  1000
```

The -n option determines the number of blocks sent. Repeat as needed. Note that a data rate of 50 kbps translates to a block rate of approximately 10 blocks per second.

Expected Results: OTU logical port 503 on all DEMUXes should receive the data without errors. Block counts should show no missing, duplicate, or out of sequence blocks. Contents of the block should be analyzed and verified to the extent that the information is available.

Actual Results:

Case 2: Transmit data to both JSC and STGT's OTU 504 from TSCD-1 using mc_test at 1.544 Mbps.

Procedures:
Logon to TSCD-1 as scdtest. Send data to OTU 504 on DEMUX A at 1.544 Mbps using mc_test:

```
mc_test  -a  225.2.0.4  -p  10504  -r  1544  -b  10/20/15/ab  -s 100  -n  25000
```

The -n option determines the number of blocks sent. Repeat as needed. Note that a data rate of 1.544 Mbps translates to a block rate of approximately 345 blocks per second or approximately 20,700 blocks per minute.

Expected Results: OTU logical port 504 should receive the data without errors. Block counts should show no missing, duplicate, or out of sequence blocks. Contents of the block should be analyzed and verified to the extent that the information is available.

Actual Results:

G.9 TEST 8

Objective: Verify data flow of PTP generated test data to the DEMUXes at various data rates

Case 1: Transmit data to OTU 501 from TPTP-1 at 50 kbps.

Procedures: Use the PTP's data generating capabilities to generate blocked data at 50 kbps to multicast address 225.2.0.1, port address 10501. Repeat as needed.

Expected Results: OTU logical port 501 on both DEMUX A and B should receive the data without errors. Block counts should show no missing, duplicate, or out of sequence blocks. Contents of the block should be analyzed and verified to the extent that the information is available.

Actual Results:

Case 2: Transmit data to OTU 502 from E171-9 at 1.544 Mbps.

Procedures: Use the PTP's data generating capabilities to generate blocked data at 1.544 Mbps to multicast address 225.2.0.2, port address 10502. Repeat as needed.

Expected Results: OTU logical port 502 should receive the data without errors. Block counts should show no missing, duplicate, or out of sequence blocks. Contents of the block should be analyzed and verified to the extent that the information is available.

Actual Results:

G.10 TEST 9

Objective: Verify that the NOC can receive traps from the MUX and the DEMUX.

Case 1: Verify that the NOC will receive a trap when an error condition occurs on a MUX.

Procedures: The MDM MIB contains a list of all possible traps. Procedures on how to generate some of these traps are available in the Acceptance Test procedures. For other traps, procedures will be determined on an as needed basis.

Expected Results: The NOC should receive the appropriate trap when the error condition occurs.

Actual Results:

Case 2: Verify that the NOC will receive a trap when an error condition occurs on a DEMUX.

Procedures: The MDM MIB contains a list of all possible traps. Procedures on how to generate some of these traps are available in the Acceptance Test procedures. For other traps, procedures will be determined on an as needed basis.

Expected Results: The NOC should receive the appropriate trap when the error condition occurs.

Actual Results:

END OF PROCEDURE

Appendix H - SN User Modules

This appendix contains the Event Description Summaries for the following Mission Operation Centers (MOC):

MOC	NUMBER OF MODULES
BRTS	6
ERBS	6
EUVE	3
GRO	2
HST	1
LDBP	3
LSAT	2
SDPF/PORTCOMM	1
Space Shuttle	2
TOPEX	6
TRMM	3
RFSOC/SOC	1
UARS	3
XTE	2

Any updates will be provided by Code 532.1 Test Team.

MOC:BRTS
SUPIDEN: C1310MS/WHSJ

Module Number: 1
Date:7/2/92

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[ ] SA1 [X] SA2 [] Open Pol [] RCP [X] LCP	[] MAF/MAR [X] SSAF/SSAR [] KSAF/KSAR Cross Support [] MAR/SSAR [] SSAF/MAR	Data Source [] Single [X] Dual Spacecraft Data Channels [X] Single [] Dual Spacecraft Data Modulation Format [X] QPSK [] BPSK	[X] 1-Coh [] 2-Non-Coh [] 3-Coh w/o deinter [] 4-Coh w/Q deinter Data Group 2 Mode [] 0-Non-Coh, w/I & w/Q deinter [] 1-Non-Coh, w/o I & w/o Q deinter [] 2-Coh, w/o 1 & w/o Q deinter [] 3-Coh, w/1 & w/Q deinter [] 4-Non-Coh, w/I & w/o Q deinter [] 5-Non-Coh, w/o I & w/Q deinter [] 6-Coh, w/o I & w/Q deinter [] 7-Coh, I & w/o Q deinter	Forward: 0 bps Return: I = 640 bps Q = 640 bps Data Format [] NRZ - L [X] NRZ - M [] NRZ - S [] BIO - L [] BIO - M [] BIO - S	[] 1- way Doppler [X] 2 - way Doppler [] Ranging [X] 1/1 sample rate [] 1/10 sample rate [] ____sample rate

Configuration Codes Used: Forward: H02 , _____ Return: J02 , _____ Tracking: T02 , _____
Logical Port Address: Forward _____, _____ Return 0201, _____
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 5 minutes
Individual Service durations:
Forward: To+ :00 through To+ 5:00
Return: To+ :30 through To+ 5:00
Tracking: To+ :31 through To+ 5:00
_____: To+_____ through To+_____

Event Timeline:

Time	Position	Description	Verification Criteria

"Hard" Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desires:

MOC:BRTS
SUPIDEN: C1311MS/WH2J

Module Number: 2
Date: 7/2/97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[] MAF/MAR	Data Source	[X] 1-Coh		[] 1- way Doppler
[X] SA2	[X] SSAF/SSAR	[] Single	[] 2-Non-Coh	Forward: 0 bps	[X] 2 - way Doppler
[] Open	[] KSAF/KSAR	[X] Dual	[] 3-Coh w/o deinter		[] Ranging
			[] 4-Coh w/Q deinter	Return:	
Pol	Cross Support	Spacecraft Data		I = ___640__bps	
[] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode	Q =__640___bps	[X] 1/1 sample rate
[X] LCP	[] SSAF/MAR	[X] Single	[] 0-Non-Coh, w/I & w/Q deinter		[] 1/10 sample rate
		[] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter	Data Format	[] ____sample rate
			[] 2-Coh, w/o 1 & w/o Q deinter	[] NRZ - L	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[X] NRZ - M	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[] NRZ - S	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] BIO - L	
		[X] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - M	
		[] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - S	

Configuration Codes Used: Forward: _H12_____ , _____ Return: _J12_____ , _____ Tracking: _T12____ , _____
Logical Port Address: Forward _____, _____ Return _202_, _____
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 5 minutes
Individual Service durations:
Forward: To+_:00__ through To+_5:00___
Return: To+_:30__ through To+_5:00___
Tracking: To+_:31__ through To+_5:00___
_____: To+_____ through To+_____

Event Timeline:

Time	Position	Description	Verification Criteria

"Hard" Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desires:

MOC:BRTS
SUPIDEN: C1312MS/ACNJ

Module Number: 3
Date: 7/2/97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[] MAF/MAR	Data Source	[X] 1-Coh		[] 1- way Doppler
[X] SA2	[X] SSAF/SSAR	[] Single	[] 2-Non-Coh	Forward: 0 bps	[X] 2 - way Doppler
[] Open	[] KSAF/KSAR	[X] Dual	[] 3-Coh w/o deinter		[] Ranging
			[] 4-Coh w/Q deinter	Return:	
Pol	Cross Support	Spacecraft Data		I = 640 bps	[X] 1/1 sample rate
[] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode	Q = 640 bps	[] 1/10 sample rate
[X] LCP	[] SSAF/MAR	[X] Single	[] 0-Non-Coh, w/I & w/Q deinter		[] ____sample rate
		[] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter	Data Format	
			[] 2-Coh, w/o 1 & w/o Q deinter	[] NRZ - L	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[X] NRZ - M	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[] NRZ - S	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] BIO - L	
		[X] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - M	
		[] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - S	

Configuration Codes Used: Forward: _H22 , _____ Return: _J22_ , _____ Tracking: _T22_ , _____
Logical Port Address: Forward _____, Return _0203_, _____
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: _____ minutes
Individual Service durations:
Forward: To+_:00___ through To+_5:00___
Return: To+_:30___ through To+_5:00___
Tracking: To+_:31___ through To+_5:00___
_____: To+_____ through To+_____

Event Timeline:

Time	Position	Description	Verification Criteria

"Hard" Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desires:

MOC: BRTS
SUPIDEN: C1313MS/ALSJ

Module Number: 4
Date: 7/2/97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft Data Source	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1 [X] SA2 [] Open Pol [] RCP [X] LCP	[] MAF/MAR [X] SSAF/SSAR [] KSAF/KSAR Cross Support [] MAR/SSAR [] SSAF/MAR	[] Single [X] Dual Spacecraft Data Channels [X] Single [] Dual Spacecraft Data Modulation Format [X] QPSK [] BPSK	[X] 1-Coh [] 2-Non-Coh [] 3-Coh w/o deinter [] 4-Coh w/Q deinter Data Group 2 Mode [] 0-Non-Coh, w/I & w/Q deinter [] 1-Non-Coh, w/o I & w/o Q deinter [] 2-Coh, w/o 1 & w/o Q deinter [] 3-Coh, w/1 & w/Q deinter [] 4-Non-Coh, w/I & w/o Q deinter [] 5-Non-Coh, w/o I & w/Q deinter [] 6-Coh, w/o I & w/Q deinter [] 7-Coh, I & w/o Q deinter	Forward: 0 bps Return: I = 640 bps Q = 640 bps Data Format [] NRZ - L [X] NRZ - M [] NRZ - S [] BIO - L [] BIO - M [] BIO - S	[] 1- way Doppler [X] 2 - way Doppler [] Ranging [X] 1/1 sample rate [] 1/10 sample rate [] ____sample rate

Configuration Codes Used: Forward: H32 , _____ Return: J32 , _____ Tracking: T32 , _____
Logical Port Address: Forward _____, _____ Return 0204,
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 5 minutes
Individual Service durations:
Forward: To+_:00_ through To+_5:00___
Return: To+_:30__ through To+_5:00___
Tracking: To+_:31 __ through To+_5:00___
_____: To+_____ through To+_____

Event Timeline:

Time	Position	Description	Verification Criteria

"Hard" Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desires:

MOC: BRTS
SUPIDEN:C1314MS/AMSJ

Module Number: 5
Date: 7/2/97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft Data Source	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1 [X] SA2 [] Open Pol [] RCP [X] LCP	[] MAF/MAR [X] SSAF/SSAR [] KSAF/KSAR Cross Support [] MAR/SSAR [] SSAF/MAR	[] Single [X] Dual Spacecraft Data Channels [X] Single [] Dual Spacecraft Data Modulation Format [X] QPSK [] BPSK	[X] 1-Coh [] 2-Non-Coh [] 3-Coh w/o deinter [] 4-Coh w/Q deinter Data Group 2 Mode [] 0-Non-Coh, w/I & w/Q deinter [] 1-Non-Coh, w/o I & w/o Q deinter [] 2-Coh, w/o 1 & w/o Q deinter [] 3-Coh, w/1 & w/Q deinter [] 4-Non-Coh, w/I & w/o Q deinter [] 5-Non-Coh, w/o I & w/Q deinter [] 6-Coh, w/o I & w/Q deinter [] 7-Coh, I & w/o Q deinter	Forward: 0 bps Return: I = 640 bps Q = 640 bps Data Format [] NRZ - L [X] NRZ - M [] NRZ - S [] BIO - L [] BIO - M [] BIO - S	[] 1- way Doppler [X] 2 - way Doppler [] Ranging [X] 1/1 sample rate [] 1/10 sample rate [] ____sample rate

Configuration Codes Used: Forward: H42 , _____ Return: J42 , Tracking: T42, _____
Logical Port Address: Forward _____, Return 0205,
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 5 minutes
Individual Service durations:
Forward: To+_:00___through To+ 5:00__
Return: To+_:30 __ through To+ 5:00__
Tracking: To+_:31 __ through To+ 5:00__
_____: To+_____ through To+_____

Event Timeline:

Time	Position	Description	Verification Criteria

"Hard" Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desires:

MOC: BRTS
SUPIDEN:C1319MS/AC2J

Module Number: 6
Date: 7/2/97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1 [X] SA2 [] Open Pol [] RCP [X] LCP	[] MAF/MAR [X] SSAF/SSAR [] KSAF/KSAR Cross Support [] MAR/SSAR [] SSAF/MAR	Data Source [] Single [X] Dual Spacecraft Data Channels [X] Single [] Dual Spacecraft Data Modulation Format [X] QPSK [] BPSK	[X] 1-Coh [] 2-Non-Coh [] 3-Coh w/o deinter [] 4-Coh w/Q deinter Data Group 2 Mode [] 0-Non-Coh, w/I & w/Q deinter [] 1-Non-Coh, w/o I & w/o Q deinter [] 2-Coh, w/o 1 & w/o Q deinter [] 3-Coh, w/1 & w/Q deinter [] 4-Non-Coh, w/I & w/o Q deinter [] 5-Non-Coh, w/o I & w/Q deinter [] 6-Coh, w/o I & w/Q deinter [] 7-Coh, I & w/o Q deinter	Forward: 0 bps Return: I = 640 bps Q = 640 bps Data Format [] NRZ - L [X] NRZ - M [] NRZ - S [] BIO - L [] BIO - M [] BIO - S	[] 1- way Doppler [X] 2 - way Doppler [] Ranging [X] 1/1 sample rate [] 1/10 sample rate [] ____sample rate

Configuration Codes Used: Forward: H99 Return: J92 Tracking: T99
Logical Port Address: Forward _____ Return 0206
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: _____ minutes
Individual Service durations:
Forward: To+_:00 __ through To+ 5:00 ___
Return: To+_:30__ through To+ 5:00___
Tracking: To+_:31__ through To+ 5:00___
_____: To+_____ through To+_____

Event Timeline:

Time	Position	Description	Verification Criteria

"Hard" Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desires:

MOC: ERBS
SUPIDEN: 1398

Module Number: 1
Date: 6/26/97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[] MAF/MAR	Data Source	[x] 1-Coh		[] 1- way Doppler
[] SA2	[x] SSAF/SSAR	[] Single	[] 2-Non-Coh	Forward:	[x] 2 - way Doppler
[x] Open	[] KSAF/KSAR	[x] Dual	[] 3-Coh w/o deinter	_1000__bps	[x] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		Return:	[] 1/1 sample rate
[] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode	I = _1600___bps	[x] 1/10 sample rate
[x] LCP	[] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q =_128000_bps	[] ____sample rate
		[x] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[x] NRZ - L	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[] NRZ - M	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
		[x] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: __H01_ , _____ Return: _J01__ , _____ Tracking: _T46_ , _____
Logical Port Address: Forward ___111, _____ Return 209___, _210__
Class (D) IP Address: _____, _____ UDPort: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: _____12_____ minutes
Individual Service durations:
Forward: To+____0_ through To+__12____
Return: To+_00:30 through To+___12___
Tracking: To+_00:40 through To+___12___
_____: To+_____ through To+_____

Event Timeline:

Time	Position	Description	Verification Criteria
AOS-10		Send UPD Request	ACK Message
AOS+00:10		Start UPD	Correct UPD Data
AOS+00:35		RTN Link Active	Receive valid TLM, I/Q Lock
AOS+2:00		Send Test CMD	CMD counter increment
			TLM change

"Hard" Limitations of Spacecraft or POCC:
Schedule AOS at least 15 min into spacecraft sunlight, and LOS at least 10 min before spacecraft eclipse due to power restrictions.

Additional and/or Scheduling Desires:

MOC: ERBS
SUPIDEN: 1398

Module Number: 2
Date: 6/26/97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[] MAF/MAR	Data Source	[] 1-Coh		[x] 1- way Doppler
[] SA2	[x] SSAF/SSAR	[] Single	[x] 2-Non-Coh	Forward:	[] 2 - way Doppler
[x] Open	[] KSAF/KSAR	[x] Dual	[] 3-Coh w/o deinter	_1000__bps	[] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		Return:	[] 1/1 sample rate
[] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode	I = _1600___bps	[x] 1/10 sample rate
[x] LCP	[] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q =_128000_bps	[] ____sample rate
		[x] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[x] NRZ - L	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[] NRZ - M	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
		[x] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: __H01_ , _____ Return: __J05_ , _____ Tracking: _T36_ , _____
Logical Port Address: Forward __111_, _____ Return _209__, __210_
Class (D) IP Address: _____, _____ UDPort: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: _____12_____ minutes
Individual Service durations:
Forward: To+__0___ through To+__12____
Return: To+_00:30 through To+___12___
Tracking: To+_00:40 through To+____12__
_____: To+_____ through To+_____

Event Timeline:

Time	Position	Description	Verification Criteria
AOS-10		Send UPD Request	ACK Message
AOS+00:10		Start UPD	Correct UPD data
AOS+00:35		RTN Link Active	Receive valid TLM, I/Q Lock
AOS+2:00		Send Test CMD	Command counter increments
			TLM change

"Hard" Limitations of Spacecraft or POCC:
Schedule AOS at least 15 min into spacecraft sunlight, and LOS at least 10 min before spacecraft eclipse due to power restrictions.

Additional and/or Scheduling Desires:

MOC: ERBS
SUPIDEN: 1398

Module Number: 3
Date: 6/26/97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft Data Source	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[x] MAF/MAR	[] Single	[x] 1-Coh		[] 1- way Doppler
[] SA2	[] SSAF/SSAR	[x] Dual	[] 2-Non-Coh	Forward:	[x] 2 - way Doppler
[x] Open	[] KSAF/KSAR		[] 3-Coh w/o deinter	_1000__bps	[x] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data Channels		Return:	[] 1/1 sample rate
[] RCP	[] MAR/SSAR	[] Single	Data Group 2 Mode	I = _1600___bps	[x] 1/10 sample rate
[x] LCP	[] SSAF/MAR	[x] Dual	[] 0-Non-Coh, w/I & w/Q deinter	Q =_32000_bps	[] ____sample rate
			[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data Modulation Format	[] 3-Coh, w/1 & w/Q deinter	[x] NRZ - L	
			[] 4-Non-Coh, w/I & w/o Q deinter	[] NRZ - M	
		[] QPSK	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[x] BPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
			[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: __A01_ , _____ Return: __B01_ , _____ Tracking: _T08_ , _____
Logical Port Address: Forward _111__, _____ Return _209__, _210__
Class (D) IP Address: _____, _____ UDPort: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: _____15_____ minutes
Individual Service durations:
Forward: To+__0___ through To+__15____
Return: To+_00:30 through To+__15____
Tracking: To+_00:40 through To+__15____
_____: To+_____ through To+_____

Event Timeline:

Time	Position	Description	Verification Criteria
AOS-10		Send UPD Request	ACK Message
AOS+00:10		Start UPD	Correct UPD Data
AOS+00:35		RTN Link Active	Receive valid TLM, I/Q Lock
AOS+5:00		Send Test CMD	CMD counter increment
			TLM change

"Hard" Limitations of Spacecraft or POCC:
Schedule AOS at least 15 min into spacecraft sunlight, and LOS at least 10 min before spacecraft eclipse.

Additional and/or Scheduling Desires:

MOC: ERBS
SUPIDEN: 1398

Module Number: 4
Date: 6/26/97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[x] MAF/MAR	Data Source	[] 1-Coh		[x] 1- way Doppler
[] SA2	[] SSAF/SSAR	[] Single	[x] 2-Non-Coh	Forward:	[] 2 - way Doppler
[x] Open	[] KSAF/KSAR	[x] Dual	[] 3-Coh w/o deinter	_1000__bps	[] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		Return:	[] 1/1 sample rate
[] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode	I = _1600___bps	[x] 1/10 sample rate
[x] LCP	[] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q = _32000_bps	[] ____sample rate
		[x] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[x] NRZ - L	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[] NRZ - M	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
		[x] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: __A01_ , _____ Return: __B06_ , _____ Tracking: _T38_ , _____
Logical Port Address: Forward __111_, _____ Return _209__, _210__
Class (D) IP Address: _____, _____ UDPort: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: _____15_____ minutes
Individual Service durations:
Forward: To+__0___ through To+__15____
Return: To+__00:30 through To+__15____
Tracking: To+__00:40 through To+__15____
_____: To+_____ through To+_____

Event Timeline:

Time	Position	Description	Verification Criteria
AOS-10		Send UPD Request	ACK Message
AOS+00:10		Start UPD	Correct UPD Data
AOS+00:35		RTN Link Active	Receive valid TLM, I/Q Lock
AOS+5:00		Send Test CMD	CMD counter increment
			TLM change

"Hard" Limitations of Spacecraft or POCC:
Schedule AOS at least 15 min into spacecraft sunlight, and LOS at least 10 min before spacecraft eclipse due to power restrictions.
Additional and/or Scheduling Desires:

MOC: ERBS
SUPIDEN: 1398

Module Number: 5
Date: 6/26/97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[] MAF/MAR	Data Source	[] 1-Coh		[] 1- way Doppler
[] SA2	[x] SSAF/SSAR	[] Single	[x] 2-Non-Coh	Forward:	[] 2 - way Doppler
[x] Open	[] KSAF/KSAR	[x] Dual	[] 3-Coh w/o deinter	_1000__bps	[] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		Return:	[] 1/1 sample rate
[] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode	I = _1600___bps	[] 1/10 sample rate
[x] LCP	[] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q =_1600_ bps	[] ____sample rate
		[x] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[x] NRZ - L	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[] NRZ - M	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
		[x] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: __H01_ , _____ Return: __J03_ , _____ Tracking: _____ , _____
Logical Port Address: Forward __111_, _____ Return __209_, __210_
Class (D) IP Address: _____, _____ UDPort: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: _____8_____ minutes
Individual Service durations:
Forward: To+___0__ through To+___8____
Return: To+_00:15 through To+____8___
Tracking: To+_____ through To+_____
_____: To+_____ through To+_____

Event Timeline:

Time	Position	Description	Verification Criteria
AOS-10		Send UPD Request	ACK Message
AOS+00:10		Start UPD	Correct UPD Data
AOS+00:20		RTN Link Active	Receive valid TLM, I/Q Lock
AOS+1:00		Send Test CMD	CMD counter increment
			TLM change

"Hard" Limitations of Spacecraft or POCC:
Schedule AOS at least 15 min into spacecraft sunlight, and LOS at least 10 min before spacecraft eclipse due to power restrictions.

Additional and/or Scheduling Desires:

MOC: ERBS
SUPIDEN: 1398

Module Number: 6
Date: 6/26/97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft Data Source	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[x] MAF/MAR	[] Single	[] 1-Coh		[] 1- way Doppler
[] SA2	[] SSAF/SSAR	[x] Dual	[x] 2-Non-Coh	Forward:	[] 2 - way Doppler
[x] Open	[] KSAF/KSAR		[] 3-Coh w/o deinter	_1000__bps	[] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data Channels		Return:	[] 1/1 sample rate
[] RCP	[] MAR/SSAR	[] Single	Data Group 2 Mode	I = _1600___bps	[] 1/10 sample rate
[x] LCP	[] SSAF/MAR	[x] Dual	[] 0-Non-Coh, w/I & w/Q deinter	Q =_1600_ bps	[] ____sample rate
			[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data Modulation Format	[] 3-Coh, w/1 & w/Q deinter	[x] NRZ - L	
			[] 4-Non-Coh, w/I & w/o Q deinter	[] NRZ - M	
		[] QPSK	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[x] BPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
			[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: __A01_ , _____ Return: __B07_ , _____ Tracking: _____ , _____
Logical Port Address: Forward __111_, _____ Return _209__, _210__
Class (D) IP Address: _____, _____ UDPort: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: _____8_____ minutes
Individual Service durations:
Forward: To+___0__ through To+___8____
Return: To+__00:15 through To+__8_____
Tracking: To+_____ through To+_____
_____: To+_____ through To+_____

Event Timeline:

Time	Position	Description	Verification Criteria
AOS-10		Send UPD Request	ACK Message
AOS+00:10		Start UPD	Correct UPD Data
AOS+00:20		RTN Link Active	Receive valid TLM, I/Q lock
AOS+1:00		Send Test CMD	CMD counter increment
			TLM change

"Hard" Limitations of Spacecraft or POCC:
Schedule AOS at least 15 min into spacecraft sunlight, and LOS at least 10 min before spacecraft eclipse due to power restrictions.

Additional and/or Scheduling Desires:

MOC: EUVE
SUPIDEN: 6951

Module Number: 1
Date: 24 June 1997

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[] MAF/MAR	Data Source	[x] 1-Coh		[] 1 way Doppler
[] SA2	[x] SSAF/SSAR	[] Single	[] 2-Non-Coh	Forward:	[x] 2 wayDoppler
[x] Open	[] KSAF/KSAR	[x] Dual	[] 3-Coh w/o deinter	bps	[x] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		MA Return:	[] 1/1 sample rate
[] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode (Type ?)	I =32K bps	[x]1/10 sample rate
[x] LCP	[] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q =32K bps	[] sample rate
		[x] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[] NRZ - L	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[x] NRZ - M	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
		[] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: H06 Return: J21 Tracking: T40
Logical Port Address: Forward: 112 Return: I=211, Q=212
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 20 minutes
Individual Service durations (approximate):
Forward: To+ 0 through To+ 20
Return: To+ .5 through To+ 20
Tracking: To+ 4 through To+ 20

Event Timeline:

Time	Position	Description	Verification Criteria
T+0	All	Event Start	
T+30sec.	All	Return link lock	lock on telemetry
T+2	POCC	command s/c to 512k telemetry	
T+2.5	POCC	GCMR	lock on telemetry
T+3	POCC	start tape dump	telemetry
T+18	POCC	end tape dump	telemetry
T+20	All	event end	no telemetry

"Hard" Limitations of Spacecraft or POCC:

NONE

Additional and/or Scheduling Desires:
Cmd+ GCMR to 512k for tape reocrder dump

MOC: EUVE
SUPIDEN: 6951

Module Number: 2
Date: 24 June 1997

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[] MAF/MAR	Data Source	[] 1-Coh		[] 1 way Doppler
[] SA2	[x] SSAF/SSAR	[] Single	[] 2-Non-Coh	Forward:	[x] 2 wayDoppler
[x] Open	[] KSAF/KSAR	[x] Dual	[] 3-Coh w/o deinter	1000 bps	[x] Ranging
			[x] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		MA Return:	[x] 1/1 sample rate
[] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode (Type ?)	I =32K bps	[]1/10 sample rate
[x] LCP	[] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q =1024K bps	[] sample rate
		[x] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[] NRZ - L	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[x] NRZ - M	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[x] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
		[] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: H01Return: J16 Tracking: T33
Logical Port Address: Forward: 112 Return: I=211, Q=212
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 30 minutes
Individual Service durations (approximate):
Forward: To+ 0 through To+ 30
Return: To+ .5 through To+ 30
Tracking: To+ 4 through To+ 30

Event Timeline:

Time	Position	Description	Verification Criteria
T+0	All	Event Start	
T+30sec.	All	Return link lock	lock on telemetry
T+2	POCC	start tape dump	telemetry
T+10	POCC	end tape dump	telemetry
T+30	All	event end telemetry	

"Hard" Limitations of Spacecraft or POCC:

NONE

Additional and/or Scheduling Desires:

MOC: EUVE
SUPIDEN: 6951

Module Number: 3
Date: 24 June 1997

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[x] MAF/MAR	Data Source	[x] 1-Coh		[] 1 way Doppler
[] SA2	[] SSAF/SSAR	[] Single	[] 2-Non-Coh	Forward:	[x] 2 wayDoppler
[] Open	[] KSAF/KSAR	[x] Dual	[] 3-Coh w/o deinter	1000 bps	[x] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		MA Return:	[] 1/1 sample rate
[] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode (Type ?)	I =32K bps	[x]1/10 sample rate
[] LCP	[] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q =32K bps	[] sample rate
		[x] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[] NRZ - L	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[x] NRZ - M	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
		[] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: A05 Return: B10 Tracking: T46
Logical Port Address: Forward: 112 Return: I=211, Q=212
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 20 minutes
Individual Service durations (approximate):
Forward: To+ 0 through To+ 20
Return: To+ .5 through To+ 20
Tracking: To+ 4 through To+ 20

Event Timeline:

Time	Position	Description	Verification Criteria
T+0	All	Event Start	
T+30sec.	All	Return link lock	lock on telemetry
T+2	POCC	uplink daily loads	telemetry
T+7	POCC	dumpdaily loads	compare to ground image
T+20	All	event end	

"Hard" Limitations of Spacecraft or POCC:

NONE

Additional and/or Scheduling Desires:

MOC:GRO
SUPIDEN: A4625MS

Module Number: 1
Date: July 1997

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[x] MAF/MAR	Data Source	[x] 1-Coh		[] 1- way Doppler
[] SA2	[] SSAF/SSAR	[] Single	[] 2-Non-Coh	Forward:	[x] 2 - way Doppler
[x] Open	[] KSAF/KSAR	[x] Dual	[] 3-Coh w/o deinter	1 bps	[] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		Return:	[] 1/1 sample rate
[] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode	I = 32 bps	[x] 1/10 sample rate
[x] LCP	[] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q = 32 bps	
		[x] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		[] ____sample rate
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[] NRZ - L	
		Modulation Format	[] 4-Non-Coh, w/I & w/o Q deinter	[x] NRZ - M	
		[x] QPSK	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[] BPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
			[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: A02 Return: B02 Tracking: T10
Logical Port Address: Forward: 113 Return: 213 (I-channel), 214 (Q-channel)
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 25 minutes
Individual Service durations:
Forward: To+ 10 through To+ 25
Return: To+ 0 through To+ 25
Tracking: To+ 10 through To+ 25

Event Timeline:

Time	Position	Description	Verification Criteria
T-0	GRO POCC	AOS	Valid telemetry; ODMs
T+10	GRO POCC	CMD S/C coho	
	GRO POCC	GCMR coho	Valid telemetry, tracking and timing
T+25	GRO POCC	GCMR non-coho	Valid telemetry

"Hard" Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desires:

MOC: GRO
SUPIDEN: A4625MS

Module Number: 2
Date: 9 July 1997

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft Data Source	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1 [] SA2 [x] Open Pol [x] RCP [] LCP	[] MAF/MAR [x] SSAF/SSAR [] KSAF/KSAR Cross Support [] MAR/SSAR [] SSAF/MAR	[] Single [x] Dual Spacecraft Data Channels [] Single [x] Dual Spacecraft Data Modulation Format [x] QPSK [] BPSK	[] 1-Coh [x] 2-Non-Coh [] 3-Coh w/o deinter [] 4-Coh w/Q deinter Data Group 2 Mode [] 0-Non-Coh, w/I & w/Q deinter [] 1-Non-Coh, w/o I & w/o Q deinter [] 2-Coh, w/o 1 & w/o Q deinter [] 3-Coh, w/1 & w/Q deinter [] 4-Non-Coh, w/I & w/o Q deinter [] 5-Non-Coh, w/o I & w/Q deinter [] 6-Coh, w/o I & w/Q deinter [] 7-Coh, I & w/o Q deinter	Forward: 1 bps Return: I = 1 bps Q = 1 bps Data Format [] NRZ - L [x] NRZ - M [] NRZ - S [] BIO - L [] BIO - M [] BIO - S	[] 1- way Doppler [] 2 -way Doppler [] Ranging [] 1/1 sample rate [x] 1/10 sample rate [] ____sample rate

Configuration Codes Used: Forward: H04 Return: I32 Tracking: T32
Logical Port Address: Forward: 113 Return: 213 (I-channel), 214 (Q-channel)
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 12 minutes
Individual Service durations:
Forward: To+ 0 through To+ 12:00
Return: To+ 0 through To+ 12:00
Tracking: To+ 0 through To+ 12:00

Event Timeline:

Time	Position	Description	Verification Criteria
T-0	GRO POCC	AOS	Valid telemetry; ODMs

"Hard" Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desires:

MOC: HST
SUPIDEN: A1446MS

Module Number: 1
Date: 25 July 1997

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[] MAF/MAR	Data Source	[] 1-Coh		[x] 1 way Doppler
[] SA2	[] SSAF/SSAR	[x] Single	[x] 2-Non-Coh	Forward:	[x] 2 wayDoppler
[x] Open	[] KSAF/KSAR	[x] Dual	[] 3-Coh w/o deinter	1000 bps	[] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		MA Return:	[] 1/1 sample rate
[] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode (Type ?)	I = 4 Kbps	[x]1/10 sample rate
[x] LCP	[x] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q =32 Kbps	[] sample rate
		[x] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	SSA Return	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	I = 1024 Kbps	
		Modulation	[x] 4-Non-Coh, w/I & w/o Q deinter		
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	Data Format	
		[x] QPSK	[] 6-Coh, w/o I & w/Q deinter	[x] NRZ - L	
		[x] BPSK	[] 7-Coh, I & w/o Q deinter	[] NRZ - M	
				[x] NRZ - S	
				[] BIO - L	
				[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: H04 Return: B13, I29 Tracking: T76, T09
Logical Port Address: SSA Forward: 114 Return: MAR I: 215, MAR Q: 216, SSAR I: 217
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 50 minutes
Individual Service durations (approximate):
Forward: To+00:05 through To+00:25
Return: To+00:00 through To+00:50
Tracking: To+00:05 through To+00:25

Event Timeline:

Time	Position	Description	Verification Criteria
00:00	All	MAR Start	STOCC verifies good MAR I&Q Data
00:05	STOCC PACOR-II	SSAF/SSAR/1-W, 2-W Trk Start	STOCC performs test commands, initiates 2-W trk and 1Mbps SSAR dump STOCC verifies command execution and receipt of SSAR at STOCC and PACOR
00:20	All	End of SSA and tracking services	None
00:50	All	End of Event	STOCC debrief to SN TD/TC

"Hard" Limitations of Spacecraft or POCC:
Additional and/or Scheduling Desires:
Module 1 will be performed via nominal HST scheduling procedures. Times given above may vary and will be briefed to the SN TD prior to event start.

MOC: LDBP
SUPIDEN: 1501

Module Number: 1
Date: 16 June 1997

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft Data Source	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1 [] SA2 [] Open Pol [] RCP [x] LCP	[x] MAF/MAR [] SSAF/SSAR [] KSAF/KSAR Cross Support [] MAR/SSAR [] SSAF/MAR	[x] Single [] Dual Spacecraft Data Channels [] Single [x] Dual Spacecraft Data Modulation Format [x] QPSK [] BPSK	[] 1-Coh [x] 2-Non-Coh [] 3-Coh w/o deinter [] 4-Coh w/Q deinter Data Group 2 Mode (Type ?) [] 0-Non-Coh, w/I & w/Q deinter [] 1-Non-Coh, w/o I & w/o Q deinter [] 2-Coh, w/o 1 & w/o Q deinter [] 3-Coh, w/1 & w/Q deinter [] 4-Non-Coh, w/I & w/o Q deinter [] 5-Non-Coh, w/o I & w/Q deinter [] 6-Coh, w/o I & w/Q deinter [] 7-Coh, I & w/o Q deinter	Forward: 125 bps MA Return: I = 4K bps Q =4K bps Data Format [] NRZ - L [x] NRZ - M [] NRZ - S [] BIO - L [] BIO - M [] BIO - S	[x] 1 way Doppler [] 2 wayDoppler [] Ranging [] 1/1 sample rate [x]1/10 sample rate [] sample rate

Configuration Codes Used: Forward: A01 Return: C21 Tracking: T09
Logical Port Address: Forward: 119 Return: I=227, Q=228
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 30 minutes
Individual Service durations (approximate):
Forward: To+ through To+
Return: To+ through To+
Tracking: To+ through To+

Event Timeline:

Time	Position	Description	Verification Criteria
T+0	POCC	AOS MAR	VERIFY ODM'S / TELEMETRY
T+0	POCC	AOS MAF	VERIFY COMMANDING
T+5	POCC	RTN REACQ	
T+10	POCC	FWD REACQ	

Spacecraft must receive all commands sent. The quality and quantity of telemetry received by the LDBP POCC must be within the error rate established by the SN for nominal realtime support.

"Hard" Limitations of Spacecraft or POCC:

NONE

Additional and/or Scheduling Desires:

MOC: LDBP
SUPIDEN: 1501

Module Number: 2
Date: 16 June 1997

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[X] SA1	[] MAF/MAR	Data Source	[] 1-Coh		[x] 1 way Doppler
[] SA2	[x] SSAF/SSAR	[] Single	[x] 2-Non-Coh	Forward:	[] 2 wayDoppler
[] Open	[] KSAF/KSAR	[x] Dual	[] 3-Coh w/o deinter	125 bps	[] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		MA Return:	[] 1/1 sample rate
[] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode (Type ?)	I = 1K bps	[x]1/10 sample rate
[x] LCP	[] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q =5K bps	[] sample rate
		[x] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[] NRZ - L	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[x] NRZ - M	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[x] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
		[] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: H01 Return: K02 Tracking: T08
Logical Port Address: Forward: 119 Return: I=227, Q=228
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 30 minutes
Individual Service durations (approximate):
Forward: To+ through To+
Return: To+ through To+
Tracking: To+ through To+

Event Timeline:

Time	Position	Description	Verification Criteria
T+0	POCC	AOS SSAR	VERIFY ODM'S / TELEMETRY
T+0	POCC	AOS SSAF	VERIFY COMMANDING
T+5	POCC	RTN REACQ	
T+10	POCC	FWD REACQ	

Spacecraft must receive all commands sent. The quality and quantity of telemetry received by the LDBP POCC must be within the error rate established by the SN for nominal realtime support.

"Hard" Limitations of Spacecraft or POCC:

NONE

Additional and/or Scheduling Desires:

MOC: LDBP
SUPIDEN: 1501

Module Number: 3
Date: 16 June 1997

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[X] SA1	[] MAF/MAR	Data Source	[] 1-Coh		[x] 1 way Doppler
[] SA2	[x] SSAF/SSAR	[] Single	[x] 2-Non-Coh	Forward:	[] 2 wayDoppler
[] Open	[] KSAF/KSAR	[x] Dual	[] 3-Coh w/o deinter	125 bps	[] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		MA Return:	[] 1/1 sample rate
[] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode (Type ?)	I = 2K bps	[x]1/10 sample rate
[x] LCP	[] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q =8K bps	[] sample rate
		[x] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[] NRZ - L	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[x] NRZ - M	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[x] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
		[] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: H01 Return: L02 Tracking: T03
Logical Port Address: Forward: 119 Return: I=227, Q=228
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 30 minutes
Individual Service durations (approximate):
Forward: To+ through To+
Return: To+ through To+
Tracking: To+ through To+

Event Timeline:

Time	Position	Description	Verification Criteria
T+0	POCC	AOS SSAR	VERIFY ODM'S / TELEMETRY
T+0	POCC	AOS SSAF	VERIFY COMMANDING
T+5	POCC	RTN REACQ	
T+10	POCC	FWD REACQ	

Spacecraft must receive all commands sent. The quality and quantity of telemetry received by the LDBP POCC must be within the error rate established by the SN for nominal realtime support.

"Hard" Limitations of Spacecraft or POCC:

NONE

Additional and/or Scheduling Desires:

MOC: LSAT Module Number: 1
SUPIDEN: B1294MS Date: 7/9/97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[**X**] MAF/MAR	Data Source	[] 1-Coh		[**X**] 1- way
[] SA2	[] SSAF/SSAR	[] Single	[**X**] 2-Non-Coh	Forward:	Doppler
[] Open	[] KSAF/KSAR	[**X**] Dual	[] 3-Coh w/o deinter	125 bps	[] 2 - way Doppler
			[] 4-Coh w/Q deinter		[] Ranging
Pol	Cross Support	Spacecraft Data		Return:	
[] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode	I = 8000 **b**ps	[] 1/1 sample rate
[**X**] LCP	[] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q =32000bps	[**X**] 1/10 sample rate
		[**X**] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		[] ____sample rate
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[] NRZ - L	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[**X**] NRZ - M	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[**X**] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
		[] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: ___A01___ , _____ Return: _B03_____ , _____ Tracking: ___T01__ ,_____
Logical Port Address: Forward 115 Return ICH =219 Q CH = 220 octal
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: ____20_____ minutes
Individual Service durations:
Forward: To+ 00:00__ through To+ 20:00
Return: To+ 00:00_ through To+_ 20:00
Tracking: To+ 00:00 through To+_ 20:00
_____: To+_____ through To+_____

Event Timeline:

Time	Position	Description	Verification Criteria
AOS+0:35	FC	INITIAL ACQ L4	RECEIVE DATA
AOS+1:30	FC	SEND NOOP; DUMP OBC	CMD CTR., RECEIVE DATA
AOS+4:00	FC	GCMR REACQ MAF	LOSE LOCK; REACQ (TLM)
AOS+4:30	FC	GCMR REACQ MAR	LOSE LOCK REACQ
AOS+6:00	FC	GCMR DCI MAF	
AOS+6:30	FC	SEND NOOP; DUMP OBC	CMD CTR. INCREMENT
AOS+9:00	FC	GCMR DCE MAF	
AOS+9:30	FC	GCMR REACQ MAR	
AOS+10:30	FC	CMD LSAT TO RCV CMDs 1K	
AOS+11:00	FC	RCFG LSAT CTRL CMD 1K	
AOS+11:30	FC	GCMR RCFG MAF 1K FWD	
AOS+12:00	FC	GCMR REACQ MAR	
AOS+12:45	FC	SEND NOOP	CMD CTR. INCREMENT
AOS+14:00	FC	CMD LSAT NON-COHO	
AOS+14:15	FC	GCMR MAR M2 NON-COHO	
AOS+16:00	FC	SEND NOOP	CMD CTR. INCREMENT
AOS+20:00		END EVENT	

* * TESTING WITH WHITE SANDS
** SINCE SCHEDULE HAS SLIPPED, PLEASE ADVISE WHEN TESTING IS TO BEGIN.

"Hard" Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desire:

MOC: LSAT
SUPIDEN: B1419MS

Module Number: 2
Date: 7/9/97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[] MAF/MAR	Data Source	[] 1-Coh		[X] 1- way Doppler
[] SA2	[X]SSAF/SSR	[] Single	[X] 2-Non-Coh	Forward:	[] 2 - way Doppler
[X]Open	[] KSAF/KSAR	[X] Dual	[] 3-Coh w/o deinter	___125____bps	[] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		Return:	[] 1/1 sample rate
[X] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode	I =	[X] 1/10 sample rate
[] LCP	[] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter	____8000___bps	[] ____sample rate
		[X] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter	Q	
			[] 2-Coh, w/o 1 & w/o Q deinter	=___8000___bps	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter		
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	Data Format	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - L	
		[X] QPSK	[] 6-Coh, w/o I & w/Q deinter	[X] NRZ - M	
		[] BPSK	[] 7-Coh, I & w/o Q deinter	[] NRZ - S	
				[] BIO - L	
				[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: ____H07__ , _____ Return: __L11____ , _____ Tracking: __T15___ ,_____
Logical Port Address: Forward 116 Return I CH =219, QCH = 220 OCTAL
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: _____10_____ minutes
Individual Service durations:
Forward: To+ 00:00:00 through To+ 00:10:00
Return: To+ 00:00:00 through To+ 00:10:00
Tracking: To+ 00:00:00 through T0+ 00:10:00
_____: To+_____ through To+_____

Event Timeline:

Time	Position	Description	Verification Criteria
AOS+0:35	FC	INITIAL ACQ L5	RECEIVE DATA
AOS+1:30	FC	SEND NOOPS	CMD CTR. INCREMENT
AOS+2:30	FC	SEND NOOPS	CMD CTR. INCREMENT
AOS+3:30	FC	SEND NOOPS	CMD CTR. INCREMENT
AOS+4:30	FC	SEND NOOPS	CMD CTR. INCREMENT
AOS+5:30	FC	SEND NOOPS	CMD CTR. INCREMENT
AOS+6:30	FC	SEND NOOPS	CMD CTR. INCREMENT
AOS+7:30	FC	SEND NOOPS	CMD CTR. INCREMENT
AOS+8:30	FC	SEND NOOPS	CMD CTR. INCREMENT
AOS+9:30	FC	SEND NOOPS	CMD CTR. INCREMENT
AOS+10:00		END EVENT	

** TESTING WITH WHITE SANDS
** CONTINUOUS FLOW OF TLM

"Hard" Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desires:

MOC: RFSOC/SOC
SUPIDEN:C1316MS

Module Number: 1
Date: 6/17/97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[x]SA1	[] MAF/MAR	Data Source	[/] 1-Coh		[] 1- way Doppler
[] SA2	[/] SSAF/SSAR	[] Single	[] 2-Non-Coh	Forward:	[/] 2 - wayDoppler
[] Open	[] KSAF/KSAR	[/] Dual	[] 3-Coh w/o deinter	____125bps	[] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		Return:	[] 1/1 sample rate
[/] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode	I = _____32kbps	[/] 1/10 samplerate
[] LCP	[] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q =_____32kbps	[] ____sample rate
		[/] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[] NRZ - L	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[/] NRZ - M	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[/] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
		[] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: __H14, _____ Return: ____I04, _____ Tracking: __T38 , _____
Logical Port Address: Forward _____, _____ Return __221, ___222
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: _____ minutes
Individual Service durations:
Forward: To+_____ through To+_____
Return: To+_____ through To+_____
Tracking: To+_____ through To+_____
_____: To+_____ through To+_____

Event Timeline:

Time	Position	Description	Verification Criteria

"Hard" Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desires:

MOC: SDPF / PORTCOMM
SUPIDEN: Y6001FE, Y6002FE, Y6021IA, Y6022IA

Module Number: 1
Date: 6/30/97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1 [] SA2 [] Open Pol [] RCP [x] LCP	[x] MAF/MAR [] SSAF/SSAR [] KSAF/KSAR Cross Support [] MAR/SSAR [] SSAF/MAR	Data Source [] Single [] Dual Spacecraft Data Channels [x] Single [] Dual Spacecraft Data Modulation Format [] QPSK [x] BPSK	[] 1-Coh [x] 2-Non-Coh [] 3-Coh w/o deinter [] 4-Coh w/Q deinter Data Group 2 Mode [] 0-Non-Coh, w/I & w/Q deinter [] 1-Non-Coh, w/o I & w/o Q deinter [] 2-Coh, w/o 1 & w/o Q deinter [] 3-Coh, w/1 & w/Q deinter [] 4-Non-Coh, w/I & w/o Q deinter [] 5-Non-Coh, w/o I & w/Q deinter [] 6-Coh, w/o I & w/Q deinter [] 7-Coh, I & w/o Q deinter	Forward: 4800 bps Return: I = 4800 bps Q =_____bps Data Format [x] NRZ - L [] NRZ - M [] NRZ - S [] BIO - L [] BIO - M [] BIO - S	[x] 1- way Doppler [] 2 - way Doppler [] Ranging [] 1/1 sample rate [x] 1/10 sample rate [] ____sample rate

Configuration Codes Used: Forward: A01 Return: B01 Tracking: T01
Logical Port Address: Forward: 141, Return: 241, 249, 250

Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 120 minutes
Individual Service durations:
Forward: To+_____ through To+_____
Return: To+_____ through To+_____
Tracking: To+_____ through To+_____
_____: To+_____ through To+_____

Event Timeline:

Time	Position	Description	Verification Criteria

An event for PORTCOM is scheduled every Thursday from 1300 to 1500 GMT and 1800 to 2000 GMT from Reston, VA (at 38.9514 N Latitude and 77.3257 W Longitude) for Return service only at 4800 BPS. Other events are schedule on an as needed basis with 2 weeks prior notice to the NCC.
The transmissions are from a ground terminal and not a space vehicle.
The nature of the data transfers is short data files of variable length and occurrence with an average of one file every 5 minutes.

Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desires:

MOC: Space Shuttle
SUPIDEN: M2008SM

Module Number: 1
Date: 7/11/97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Shuttle Mode Return	Initial Data Rates	Tracking
[] SA1 [x] SA2 [] Open Pol [x] RCP [] LCP	[] MAF/MAR [x]SSAF/SSAR [x]KSAF/KSAR Cross Support [] MAR/SSAR [] SSAF/MAR	Data Source [] Single [] Dual Spacecraft Data Channels [] Single [] Dual Spacecraft Data Modulation Format [] QPSK [] BPSK	[] PM Mode 1 [] FM Mode 2 [] FM Digital Data K-band CH 3 [x]FM Mode 4 TV CH 3 Data Group 1 Mode [] 1-Coh [] 2-Non-Coh [] 3-Coh w/o deinter [] 4-Coh w/Q deinter Data Group 2 Mode [] 0-Non-Coh, w/I & w/Q deinter [] 1-Non-Coh, w/o I & w/o Q deinter [] 2-Coh, w/o 1 & w/o Q deinter [] 3-Coh, w/1 & w/Q deinter [] 4-Non-Coh, w/I & w/o Q deinter [] 5-Non-Coh, w/o I & w/Q deinter [] 6-Coh, w/o I & w/Q deinter [] 7-Coh, I & w/o Q deinter	S-band FWD: Shuttle Mode 2 S-band FWD__72_Kbps K-band FWD: Shuttle Mode___1___ K-band FWD:___216_Kbps K-band Return: CH 1 __192__ Kbps CH 2___1024_Kbps CH 3_____Kbps Data Format [x] NRZ - L [] NRZ - M [] NRZ - S [] BIO - L [] BIO - M [] BIO - S	[] 1- way Doppler [x] 2 - way Doppler [] Ranging [] 1/1 sample rate [x]1/10 sample rate [] ____sample rate

Configuration Codes Used: Forward: _H54_ , __N52__ Return: __I52__ , __P52___ Tracking: _T54_ , _____
Logical Port Address: Forward _0403_, __0402__ Return ___0231__, __0232__, __0233__ 0234

Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 120 minutes
Individual Service durations:
Forward: To+_____ through To+_____
Return: To+_____ through To+_____
Tracking: To+_____ through To+_____
_____: To+_____ through To+_____

THIS WILL TEST TDE SA2 INTERFACES

Event Timeline:

Time	Position	Description	Verification Criteria

Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desires:

MOC: Space Shuttle
SUPIDEN: M2008SM

Module Number: 2
Date: 7/11/97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Shuttle Mode Return	Initial Data Rates	Tracking
[] SA1	[] MAF/MAR	Data Source	[] PM Mode 1	S-band FWD: Shuttle	[] 1- way Doppler
[x] SA2	[x]SSAF/SSAR	[] Single	[] FM Mode 2	Mode 2	[x] 2 - way Doppler
[] Open	[x]KSAF/KSAR	[] Dual	[] FM Digital Data K-band CH 3	S-band FWD__72_Kbps	[] Ranging
			[x]FM Mode 4 TV CH 3		
Pol	Cross Support	Spacecraft Data		K-band FWD: Shuttle	[] 1/1 sample rate
[x] RCP	[] MAR/SSAR	Channels	Data Group 1 Mode	Mode___1___	[x]1/10 sample rate
[] LCP	[] SSAF/MAR	[] Single	[] 1-Coh	K-band	[] ____sample rate
		[] Dual	[] 2-Non-Coh	FWD:___216_Kbps	
			[] 3-Coh w/o deinter		
		Spacecraft Data	[] 4-Coh w/Q deinter	K-band Return:	
		Modulation		CH 1 __192__ Kbps	
		Format	Data Group 2 Mode	CH 2___1024_Kbps	
		[] QPSK	[] 0-Non-Coh, w/I & w/Q deinter	CH 3_____Kbps	
		[] BPSK	[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
			[] 3-Coh, w/1 & w/Q deinter	[x] NRZ - L	
			[] 4-Non-Coh, w/I & w/o Q deinter	[] NRZ - M	
			[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
			[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
			[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: _H53_ , __N51__ Return: __I51__ , __P51___ Tracking: _T53_ , _____
Logical Port Address: Forward _0404_, __0401__ Return ___0235__, __0232__, __0233__ 0234
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)
Event Times: (note earliest service Start time is To)
Overall duration: _____ minutes
Individual Service durations:
Forward: To+_____ through To+_____
Return: To+_____ through To+_____
Tracking: To+_____ through To+_____
_____: To+_____ through To+_____

THIS WILL TEST TDW & SA1 INTERFACES
Event Timeline:

Time	Position	Description	Verification Criteria

Limitations of Spacecraft or POCC:
Additional and/or Scheduling Desires:

Event Description

A normal SN Verification/Validation test should be performed, the following are some suggested enhancements to the testing to exercise the IP interfaces to a greater degree. Normal SN Ver/Val procedures will be used these are just some generic enhancements to the test.

Forward Link Testing - Houston Command verifies the interface with ESTL via single commands, as many as is require to confirm a good interface. Houston Command also confirms a valid command echo. After the interface is confirmed Houston Command will initiate rapid command uplinks, 1 per second, for 10 min. Command transmission will be validated via comparisons from the echo. During the rapid command testing GCMR,s will be sent to reconfigure the return link K-Band channel 2 interface to different data rates with data flow to bandwidth changes during commanding. (i.e.; start a dump at 1024 Kbps and reconfigure for a 960 dump during a commanding sequence.) ESTL can disable their uplink verification printer during the rapid command testing.

Houston Command will perform the same sequence of testing for all uplink data rates on both S-Band and K-Band interfaces

Return Link Testing - All data rates will be tested as in a nominal SN Ver/Val, (i.e.; S-Band 96/192 Kbps, K-Band channel 1 192 Kbps, K-band channel 2 960/1024 Kbps & 2 Mbps OCA.) K-Band channel 3 will also be tested via the MDM interface. During 192 Kbps tesing ESTL will simultaneously transmit data via the S-band and K-Band channel 1 interfaces. When K-Band channel 3 is to be tested, ESTL will simultaneously transmit 1024 Kbps data via the K-Band channel 2 and K-Band channel 3 interfaces. WSC will configure the K-Band channel 3 interface to a MDM channel and Houston DFE will validate the channel 2 and channel 3 signal quality.

Air-to-Ground Voice Testing - Voice testing will be per nominal SN Ver/Val procedures between ESTL and Houston Comm Tech.

Tracking Data Testing - Testing will be per nominal SN Ver/Val procedures between WSC and Houston Track.

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[X] MAF/MAR	Data Source	[] 1-Coh		[X] 1- way Doppler
[] SA2	[] SSAF/SSAR	[X] Single	[X] 2-Non-Coh	Forward:	[] 2 - way Doppler
[] Open	[] KSAF/KSAR	[] Dual	[] 3-Coh w/o deinter	___0____bps	[] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		Return:	[] 1/1 sample rate
[] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode	I =___16KPBS	[X] 1/10 sample rate
[X] LCP	[] SSAF/MAR	[X] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q =__16KBPS	[] ____sample rate
		[] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[] NRZ - L	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[X] NRZ - M	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[X] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
		[] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: _____ , _____ Return: _B09_____ , _____ Tracking: _T10____ , _____
Logical Port Address: Forward _____, _____ Return 223__I CH___ _, 229__Q CH____
Class (D) IP Address: _____, _____ UDPort: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: _____30____ minutes
Individual Service durations:
Forward: To+_____ through To+_____
Return: To+_00:00 through To+___30_____
Tracking: To+_00:00 through To+___30_____
_____: To+_____ through To+_____

Event Timeline: MONITOR-MA

Time	Position	Description	Verification Criteria
T_0	ACE	Start Event	POCC Verifies AOS
T_0 +2:00	ACE	Monitor S/C Health	Alarm Status
T0 +3:00	ACE	End Event	POCC Verifies LOS

"Hard" Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desires:

MOC: TOPEX Module Number: 2
SUPIDEN: J4377MS Date: 7/17/97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[X] MAF/MAR	Data Source	[] 1-Coh		[] 1- way Doppler
[] SA2	[] SSAF/SSAR	[X] Single	[X] 2-Non-Coh	Forward:	[X] 2 - way Doppler
[] Open	[] KSAF/KSAR	[] Dual	[] 3-Coh w/o deinter	_1 KBPS	[] Ranging
			[] 4-Coh w/Q deinter	Return:	
Pol	Cross Support	Spacecraft Data		I = 16KBPS	[] 1/1 sample rate
[] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode	Q = 16KBPS	X] 1/10 sample rate
[X] LCP	[] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter		[] ____sample rate
		[X] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter	Data Format	
			[] 2-Coh, w/o 1 & w/o Q deinter	[] NRZ - L	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[X] NRZ - M	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[] NRZ - S	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] BIO - L	
		[X] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - M	
		[] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - S	

Configuration Codes Used: Forward: A01_ , _____ Return: B03_ , _____ Tracking: T08_ , _____
Logical Port Address: Forward 117_, _____ Return 223_, 229__
Class (D) IP Address: _____, _____ UDPort: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: _____30_____ minutes
Individual Service durations:
Forward: To+_00:00 through To+___30___
Return: To+_00:00 through To+___30___
Tracking: To+_00:00 through To+___30___
_____: To+_____ through To+_____

Event Timeline: LOAD MRD-MA

Time	Position	Description	Verification Criteria
T_0		Start Event	POCC Verifies AOS
T_0 +02:00	ACE	Monitor S/C Health	Alarm Status
T_0 +04:00	ACE	Send Command to Start Dump	POCC Verifies Receipt of Dump
T_0 +30:00		End Event	POCC Verifies LOS

"Hard" Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desires:

MOC: TOPEX
SUPIDEN: J4377MS

Module Number: 3
Date: 7/17/97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[] MAF/MAR	Data Source	[X] 1-Coh		[] 1- way Doppler
[] SA2	[X] SSAF/SSAR	[] Single	[] 2-Non-Coh	Forward:	[X] 2 - way Doppler
[X] Open	[] KSAF/KSAR	[X] Dual	[] 3-Coh w/o deinter	1KBPS	[] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		Return:	[] 1/1 sample rate
[] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode	I = 16 KBPS	[X] 1/10 sample rate
[X] LCP	[] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q =32 KBPS	[] ____sample rate
		[X] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[] NRZ - L	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[X] NRZ - M	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[X] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
		[] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: H01 , _____ Return: I03 , _____ Tracking: T07 , _____
Logical Port Address: Forward 117, Return 223 I CH, 229 Q CH
Class (D) IP Address: _____, _____ UDPort: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: _____30_____ minutes
Individual Service durations:
Forward: To+_00:00 through To+___30___
Return: To+_00:00 through To+___30___
Tracking: To+_00:00 through To+___30___
_____: To+_____ through To+_____

Event Timeline: LOAD MRO-SA

Time	Position	Description	Verification Criteria
T_0		Start Event	POCC Verifies AOS
T_0 +02:00	ACE	Monitor S/C Health	Alarm Status
T_0 +04:00	ACE	Send Command to Start Dump	POCC Verifies Receipt of Dump
T_0 +30:00		End Event	POCC Verifies LOS

"Hard" Limitations of Spacecraft or POCC:
Additional and/or Scheduling Desires:

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[] MAF/MAR	Data Source	[X] 1-Coh		[] 1- way Doppler
[] SA2	[x] SSAF/SSAR	[] Single	[] 2-Non-Coh	Forward:	[X] 2 - way Doppler
[x] Open	[] KSAF/KSAR	[X] Dual	[] 3-Coh w/o deinter	1 KBPS	[] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		Return:	[] 1/1 sample rate
[] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode	I = 16 KBPS	[X] 1/10 sample rate
[x] LCP	[] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q = 512 KBPS	[] ____sample rate
		[x] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[X] NRZ - L	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[X] NRZ - M	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[x] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
		[] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: H07 , _____ Return: I12, _____ Tracking: T13, _____
Logical Port Address: Forward 117, _____ Return 223 I CH, 229 Q CH
Class (D) IP Address: _____, _____ UDPort: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: _____ minutes
Individual Service durations:
Forward: To+_00:00 through To+_30__
Return: To+_00:00 through To+ 30
Tracking: To+_00:00 through To+_30__
_____: To+_____ through To+_____

Event Timeline:

Time	Position	PBK-SA Description	Verification Criteria
T_0		Start Event	POCC Verifies AOS
T_0 +01:00		Monitor S/C Health	Alarm Status
T_0 +02:00		Send Command to Configure SC for T/R Playback	Check Command QTR via TLM
T_0 +03:00		Send GCMRs to Configure Ground Station for Q Channel	
T_0 +04:00		Send Command to Start Playback	Verify Q Channel in Logic and Receipt of Data
T_0 +20:00		Send Command to Reconfigure S/C for R/T TLM	
T_0 +30:00		End Event	POCC Verifies LOS

MOC: TOPEX
SUPIDEN: J4377MS

Module Number: 5
Date:7/17/97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[] MAF/MAR	Data Source	[] 1-Coh		[X] 1- way Doppler
[] SA2	[X] SAF/SSAR	[] Single	[X] 2-Non-Coh	Forward:	[] 2 - way Doppler
[X] Open	[] KSAF/KSAR	[X] Dual	[] 3-Coh w/o deinter	1 KBPS	[] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		Return:	[] 1/1 sample rate
[] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode	I = 16 KBPS	[X] 1/10 sample rate
[X] LCP	[] SSAF/MAR	[X] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q = 16 KBPS	[] ____sample rate
		[] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		
		Spacecraft Data Modulation Format	[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		[X] QPSK	[] 3-Coh, w/1 & w/Q deinter	[] NRZ - L	
		[] BPSK	[] 4-Non-Coh, w/I & w/o Q deinter	[X] NRZ - M	
			[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
			[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
			[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: H02 , _____ Return: I02 , _____ Tracking: T17, _____
Logical Port Address: Forward 117, _____ Return I CH 223_____, Q CH 229_____
Class (D) IP Address: _____, _____ UDPort: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: _____*_____ minutes * As Required 5 - 60 minutes
Individual Service durations:
Forward: To+_00:00 through To+___*____
Return: To+_00:00 through To+___*____
Tracking: To+_00:00 through To+___*____
_____: To+_____ through To+_____

Event Timeline: OMNI-SCI-NC

Time	Position	Description	Verification Criteria
T0		Start Event	POCC Verifies AOS
T0 +01:00	ACE	Monitor S/C Health	Alarm Status
T0 +*		End Event	POCC Verifies LOS

"Hard" Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desires:

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft Data Source	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1 [] SA2 [X] Open Pol [X] RCP [] LCP	[] MAF/MAR [X] SSAF/SSAR [] KSAF/KSAR Cross Support [] MAR/SSAR [] SSAF/MAR	[] Single [X] Dual Spacecraft Data Channels [] Single [X] Dual Spacecraft Data Modulation Format [X] QPSK [] BPSK	[] 1-Coh [X] 2-Non-Coh [] 3-Coh w/o deinter [] 4-Coh w/Q deinter Data Group 2 Mode [] 0-Non-Coh, w/I & w/Q deinter [] 1-Non-Coh, w/o I & w/o Q deinter [] 2-Coh, w/o 1 & w/o Q deinter [] 3-Coh, w/1 & w/Q deinter [] 4-Non-Coh, w/I & w/o Q deinter [] 5-Non-Coh, w/o I & w/Q deinter [] 6-Coh, w/o I & w/Q deinter [] 7-Coh, I & w/o Q deinter	Forward: 1 KBPS Return: I = 1 KBPS Q = 32 KPBS Data Format [] NRZ - L [X] NRZ - M [] NRZ - S [] BIO - L [] BIO - M [] BIO - S	[X] 1- way Doppler [] 2 - way Doppler [] Ranging [] 1/1 sample rate [X] 1/10 sample rate [] ____sample rate

Configuration Codes Used: Forward: H02 , _____ Return: I05, _____ Tracking: T16, _____
Logical Port Address: Forward 117, _____ Return I CH 223, Q CH 229
Class (D) IP Address: _____, _____ UDPort: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: _____*_____ minutes * As Required 5 - 60 minutes
Individual Service durations:
Forward: To+_00:00 through To+___*_____
Return: To+_00:00 through To+___*_____
Tracking: To+_00:00 through To+___*_____
_____: To+_____ through To+_____

Event Timeline: OMIN-MRO-NC

Time	Position	Description	Verification Criteria
T_0		Start Event	POCC Verifies AOS
T_0 +*		End Event	POCC Verifies LOS

"Hard" Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desires:

MOC: TRMM
SUPIDEN: A0338SM

Module Number: 1
Date: 2 July 1997

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1 [] SA2 [x] Open Pol [] RCP [x] LCP	[] MAF/MAR [x] SSAF/SSAR [] KSAF/KSAR Cross Support [] MAR/SSAR [] SSAF/MAR	Data Source [] Single [x] Dual Spacecraft Data Channels [] Single [x] Dual Spacecraft Data Modulation Format [x] QPSK [] BPSK	[] 1-Coh [] 2-Non-Coh [x] 3-Coh w/o deinter [] 4-Coh w/Q deinter Data Group 2 Mode (Type ?) [] 0-Non-Coh, w/I & w/Q deinter [] 1-Non-Coh, w/o I & w/o Q deinter [] 2-Coh, w/o 1 & w/o Q deinter [] 3-Coh, w/1 & w/Q deinter [] 4-Non-Coh, w/I & w/o Q deinter [] 5-Non-Coh, w/o I & w/Q deinter [] 6-Coh, w/o I & w/Q deinter [] 7-Coh, I & w/o Q deinter	Forward: 1000 bps MA Return: I =32K bps Q =2048K bps Data Format [x] NRZ - L [] NRZ - M [] NRZ - S [] BIO - L [] BIO - M [] BIO - S	[] 1 way Doppler [x] 2 wayDoppler [] Ranging [] 1/1 sample rate [x]1/10 sample rate [] sample rate

Configuration Codes Used: Forward: H01 Return: J01 Tracking: T01
Logical Port Address: Forward: 108 Return: 251, 252
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 20 minutes
Individual Service durations (approximate):
Forward: To+ 0 through To+ 20
Return: To+ .5 through To+ 20
Tracking: To+ 1 through To+ 20

Event Timeline:

Time	Position	Description	Verification Criteria
T+1		Test Command	Real-time command
T+1		Reorder Playback	Stored command
T+10		Reorder retransmissions	Real-time command
T+15		Release data set	Real-time command
.			
T+3		Stored Command locks	Twice per day a load will be uplinked

"Hard" Limitations of Spacecraft or POCC:
- Two orbits of record capacity (220 minutes)
- Can not use MA (due to Freq.)

Additional and/or Scheduling Desires:
1 20 minute SSA event every orbit

MOC: TRMM
SUPIDEN: A0338SM

Module Number: 2
Date: 2 July 1997

Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[] MAF/MAR	Data Source	[] 1-Coh		[] 1 way Doppler
[] SA2	[x] SSAF/SSAR	[] Single	[] 2-Non-Coh	Forward:	[x] 2 wayDoppler
[x] Open	[] KSAF/KSAR	[x] Dual	[x] 3-Coh w/o deinter	1000 bps	[] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		MA Return:	[] 1/1 sample rate
[] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode (Type ?)	I =32K bps	[x]1/10 sample rate
[x] LCP	[] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q =2048K bps	[] sample rate
		[x] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[x] NRZ - L	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[] NRZ - M	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[x] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
		[] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: H01 Return: J01 Tracking: T01, T23
Logical Port Address: Forward: 108 Return: 251, 252
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 20 minutes
Individual Service durations (approximate):
Forward: To+ 0 through To+ 20
Return: To+ .5 through To+ 20
Tracking: To+ 1 through To+ 11
T23 To+12 through To+ 20

Event Timeline:

Time	Position	Description	Verification Criteria
T+1		Test Command	Real-time command
T+1		Reorder Playback	Stored command
T+9		Reorder retransmissions	Real-time command
T+10		Coherency switch	Real-time command

Real-time command issued to change coherency (Non-Coherent) and to reconfigure Q-channel for 128 Kbps

T+11	Release data set	Real-time command

"Hard" Limitations of Spacecraft or POCC:
- Two orbits of record capacity (220 minutes)
- Can not use MA (due to Freq.)

Additional and/or Scheduling Desires:
1 20 minute SSA event every orbit

MOC: TRMM
SUPIDEN: A0338SM

Module Number: 3
Date: 2 July 1997

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[] MAF/MAR	Data Source	[] 1-Coh		[x] 1 way Doppler
[] SA2	[x] SSAF/SSAR	[] Single	[x] 2-Non-Coh	Forward:	[] 2 wayDoppler
[x] Open	[] KSAF/KSAR	[x] Dual	[] 3-Coh w/o deinter	1000 bps	[] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		MA Return:	[] 1/1 sample rate
[x] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode (Type ?)	I =1K bps	[x]1/10 sample rate
[LCP	[] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q =1K bps	[] sample rate
		[x] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[x] NRZ - L	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[] NRZ - M	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[x] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
		[] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: H05 Return: J25 Tracking: T25
Logical Port Address: Forward: 108 Return: 251, 252
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 10 minutes
Individual Service durations (approximate):
Forward: To+ 0 through To+ 10
Return: To+ 0 through To+ 10
Tracking: To+ 0 through To+ 10

Event Timeline:

Time	Position	Description	Verification Criteria
T+1		Test Command	Real-time command

"Hard" Limitations of Spacecraft or POCC:
- Two orbits of record capacity (220 minutes)
- Can not use MA (due to Freq.)

Additional and/or Scheduling Desires:
1 20 minute SSA event every orbit

MOC: UARS Module Number: 1 .
SUPIDEN: 3782 Date: 6-27-97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[] MAF/MAR	Data Source	[] 1-Coh		[] 1- way Doppler
[] SA2	[x] SSAF/SSAR	[] Single	[] 2-Non-Coh	Forward:	[x] 2 - way Doppler
[x] Open	[] KSAF/KSAR	[?] Dual	[] 3-Coh w/o deinter	1 K bps	[x] Ranging
			[x] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		Return:	
[x] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode	I = 32 K bps	[] 1/1 sample rate
[] LCP	[] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q = 512 K bps	[x] 1/10 sample rate
		[x] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	[] ____sample rate
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[] NRZ - L	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[x] NRZ - M	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[x] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
		[] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: H11 , _____ Return: : J15 , _____ Tracking: : T15 , _____
Logical Port Address: Forward 118 , _____ Return 225 (I) , 226 (Q) .
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 15:30 minutes
Individual Service durations:
Forward: To+ :00 through To+ 15:30
Return: To+ :30 through To+ 15:30
Tracking: To+ :31 through To+ 15:30
_____: To+_____ through To+_____

Event Timeline:

Time	Position	Description		Verification Criteria
01:00			NOOP cmd	cmd counter update
01:30		?	512K NBTR dump (Q chnl)	TPF/IPD display
07:00		?	cmd NBTR to original posn.	telemetry
08:00		?	OBC command/ephem load	telemetry
10:00			reconfigure S/C for OBC dump	telemetry
11:00			GCMR to 32K on Q channel	
13:00			32K OBC dump (Q chnl)	telemetry
15:00			send Transmittter Off cmd	

"Hard" Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desires:

Since UARS has only 2 ephemeris banks onboard the spacecraft, we will be relying on only one "regular" TDRS sattellite for normal operations during the test period. The second ephemeris bank will be loaded with TDS ephemeris. In order to assure safe ephemeris loading and normal operations, UARS will require one 15 1/2 minute SSA event on the "regular" TDRS that we plan on using every orbit from 3 hours before the first test event to 3 hours after the last test event.

MOC: UARS
SUPIDEN: 3782

Module Number: 2 .
Date: 6-27-97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[] MAF/MAR	Data Source	[] 1-Coh		[x] 1- way Doppler
[] SA2	[x] SSAF/SSAR	[] Single	[x] 2-Non-Coh	Forward:	[] 2 - way Doppler
[x] Open	[] KSAF/KSAR	[?] Dual	[] 3-Coh w/o deinter	1 K bps	[] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		Return:	[] 1/1 sample rate
[x] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode	I = 32 K bps	[x] 1/10 sample
[] LCP	[] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q = 32 K bps	rate
		[x] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		[] ____sample rate
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[] NRZ - L	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[x] NRZ - M	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[x] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
		[] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: H11 , _____ Return: : J16 , _____ Tracking: : T29 , _____
Logical Port Address: Forward 118 , _____ Return 225 (I) , 226 (Q) .
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 15:30 minutes
Individual Service durations:
Forward: To+ :00 through To+ 15:30
Return: To+ :30 through To+ 15:30
Tracking: To+ :31 through To+ 15:30
_____: To+_____ through To+_____

Event Timeline:

Time	Position	Description		Verification Criteria	
01:00			NOOP cmd		cmd counter update
02:00		?	OBC command/ephem load	telemetry	
07:00			32K OBC dump (Q chnl)		telemetry
15:00			send Transmittter Off cmd		

]"Hard" Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desires:

Since UARS has only 2 ephemeris banks onboard the spacecraft, we will be relying on only one "regular" TDRS sattellite for normal operations during the test period. The second ephemeris bank will be loaded with TDS ephemeris. In order to assure safe ephemeris loading and normal operations, UARS will require one 15 1/2 minute SSA event on the "regular" TDRS that we plan on using every orbit from 3 hours before the first test event to 3 hours after the last test event.

MOC: UARS
SUPIDEN: 3782

Module Number: 3 .
Date: 6-27-97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[] MAF/MAR	Data Source	[] 1-Coh		[x] 1- way Doppler
[] SA2	[x] SSAF/SSAR	[] Single	[x] 2-Non-Coh	Forward:	[] 2 - way Doppler
[x] Open	[] KSAF/KSAR	[?] Dual	[] 3-Coh w/o deinter	1 K bps	[] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data		Return:	[] 1/1 sample rate
[x] RCP	[] MAR/SSAR	Channels	Data Group 2 Mode	I = 1 K bps	[x] 1/10 sample rate
[] LCP	[] SSAF/MAR	[] Single	[] 0-Non-Coh, w/I & w/Q deinter	Q = 1 K bps	[] ____sample rate
		[x] Dual	[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data	[] 3-Coh, w/1 & w/Q deinter	[] NRZ - L	
		Modulation	[] 4-Non-Coh, w/I & w/o Q deinter	[x] NRZ - M	
		Format	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
		[x] QPSK	[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
		[] BPSK	[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: H31 , _____ Return: : J36 , _____ Tracking: : T39 , _____
Logical Port Address: Forward 118 , _____ Return 225 (I) , 226 (Q) .
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 10:00 minutes
Individual Service durations:
Forward: To+ :00 through To+ 10:00
Return: To+ :30 through To+ 10:00
Tracking: To+ :31 through To+ 10:00
_____: To+_____ through To+_____

Event Timeline:

Time	Position	Description	Verification Criteria
00:00		GCMR Forward link to 1K	
02:00		NOOP cmd	cmd counter update
15:00		send Transmittter Off cmd	

"Hard" Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desires:

Since UARS has only 2 ephemeris banks onboard the spacecraft, we will be relying on only one "regular" TDRS sattellite for normal operations during the test period. The second ephemeris bank will be loaded with TDS ephemeris. In order to assure safe ephemeris loading and normal operations, UARS will require one 15 1/2 minute SSA event on the "regular" TDRS that we plan on using every orbit from 3 hours before the first test event to 3 hours after the last test event.

MOC: XTE
SUPIDEN: A6581MS

Module Number: 1 .
Date: 6-18-97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft Data Source	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1	[x] MAF/MAR	[] Single	[] 1-Coh		[] 1- way Doppler
[] SA2	[] SSAF/SSAR	[x] Dual	[x] 2-Non-Coh	Forward:	[] 2 - way Doppler
[] Open	[] KSAF/KSAR		[] 3-Coh w/o deinter	1 K bps	[] Ranging
			[] 4-Coh w/Q deinter		
Pol	Cross Support	Spacecraft Data Channels		Return:	[] 1/1 sample rate
[] RCP	[] MAR/SSAR	[] Single	Data Group 2 Mode	I = 32 K bps	[] 1/10 sample rate
[x] LCP	[] SSAF/MAR	[x] Dual	[] 0-Non-Coh, w/I & w/Q deinter	Q = 64 K bps	[] ____sample rate
			[] 1-Non-Coh, w/o I & w/o Q deinter		
			[] 2-Coh, w/o 1 & w/o Q deinter	Data Format	
		Spacecraft Data Modulation Format	[] 3-Coh, w/1 & w/Q deinter	[x] NRZ - L	
		[x] QPSK	[] 4-Non-Coh, w/I & w/o Q deinter	[] NRZ - M	
		[] BPSK	[] 5-Non-Coh, w/o I & w/Q deinter	[] NRZ - S	
			[] 6-Coh, w/o I & w/Q deinter	[] BIO - L	
			[] 7-Coh, I & w/o Q deinter	[] BIO - M	
				[] BIO - S	

Configuration Codes Used: Forward: A01 , _____ Return: : E01 , _____ Tracking: : T11 , _____
Logical Port Address: Forward 138 , _____ Return 239 , 240 .
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 20:00 minutes
Individual Service durations:
Forward: To+ :00 through To+ 20:00
Return: To+ :00 through To+ 20:00
Tracking: To+ :00 through To+ 20:00
_____: To+_____ through To+_____

Event Timeline:

Time	Position	Description	Verification Criteria
T-1		Verify an operational non-tlm (UPD/GCMR) link	
T+1		Verify initial receipt of valid I & Q-Chnl telemetry at 32/64 Kbps	
T+1		Transmit Center Freq Offset GCMR as necessary	
T+2		Ensure receipt of valid I-Chnl telemetry	
T+3		Transmit NOOP commands at 1Kpbs uplink rate	
T+5		Transmit recorder rexmit and/or data set release cmds as necessary.	
T+20		End of event	

"Hard" Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desires:

During some MA events the XTE FOT may issue a center freq. offset GCMR at minutes 01 of the event. This will cause the downlink to dropout for several seconds before reacquiring w/o ground intervention. Purpose is to characterize center freq. frift on either of the XTE HGA.

MOC: XTE
SUPIDEN: A6581MS

Module Number: 2 .
Date: 6-18-97

Event Description Summary
IP Transition Test and Operations

Antenna	Normal Support	Spacecraft Data Source	Data Group 1 Mode	Initial Data Rates	Tracking
[] SA1 [] SA2 [x] Open Pol [] RCP [x] LCP	[] MAF/MAR [x] SSAF/SSAR [] KSAF/KSAR Cross Support [] MAR/SSAR [] SSAF/MAR	[] Single [x] Dual Spacecraft Data Channels [] Single [x] Dual Spacecraft Data Modulation Format [x] QPSK [] BPSK	[] 1-Coh [] 2-Non-Coh [x] 3-Coh w/o deinter [] 4-Coh w/Q deinter Data Group 2 Mode [] 0-Non-Coh, w/I & w/Q deinter [] 1-Non-Coh, w/o I & w/o Q deinter [] 2-Coh, w/o 1 & w/o Q deinter [] 3-Coh, w/1 & w/Q deinter [] 4-Non-Coh, w/I & w/o Q deinter [] 5-Non-Coh, w/o I & w/Q deinter [] 6-Coh, w/o I & w/Q deinter [] 7-Coh, I & w/o Q deinter	Forward: 1 K bps Return: I = 32 K bps Q = 1024 K bps Data Format [x] NRZ - L [] NRZ - M [] NRZ - S [] BIO - L [] BIO - M [] BIO - S	[] 1- way Doppler [x] 2 - way Doppler [x] Ranging [] 1/1 sample rate [x] 1/10 sample rate [] ____sample rate

Configuration Codes Used: Forward: H01 , _____ Return: K01 , _____ Tracking: : T03 , _____
Logical Port Address: Forward 138 , _____ Return 239 , 240 .
Class (D) IP Address: _____, _____ UDP Port: _____ Source Net: _____(Provided by Nascom)

Event Times: (note earliest service Start time is To)
Overall duration: 20:00 minutes
Individual Service durations:
Forward: To+ 00:30 through To+ 20:00
Return: To+ 00:00 through To+ 20:00
Tracking: To+ 01:00 through To+ 06:00
Tracking_: To+ 08:00_ through To+_13:00_

Event Timeline:

Time	Position	Description	Verification Criteria
T-1		Verify an operational non-tlm (UPD/GCMR) link	
T+1		Verify initial receipt of valid I & Q-Chnl telemetry at 32/1024 Kbps	
T+1		Transmit NOOP commands at 1Kpbs uplink rate	
T+2		Monitor Recorder Dump activity; issue recorder re-xmit and/or data set release cmds as necessary.	
T+20		End of event	

"Hard" Limitations of Spacecraft or POCC:

Additional and/or Scheduling Desires:

Abbreviations and Acronyms

BER	Bit Error Rate
BERT	Bit Error Rate Test
BERTS	Bit Error Rate Test Set
CAB	Circuit Assurance Block
CCBTS	Common Carrier Broadcast Data Transimission System
CD	Conversion Device
CDM	Conversion Device Management
CDSS	Consolidated Data Select Switch
CSS	Control and Status System
DCN	Document Change Notice
DCS	DMS Control System
DEMUX	Demultiplexer
DMS	Digital Matrix Switch
Domsat	Domestic Satellite
DSN	Deep Space Network
ESTL	Electronic System Test Laboratory
GN	Ground Network
GCMR	Ground Control Message Request
GTD	Goddard Test Director
HCC	Houston Comm Control
GSFC	Goddard Space Flight Center
FAT	Factory Acceptance Test
FDF	Flight Dynamics Facility
ICLU	Interbuilding Communication Link Upgrade
IOnet	Internet Protocol Operational Network
IP	Internet Protocol
JSC	Johnson Space Center
Kbps	kilobits per second
kHz	kilohertz
LAN	Local Area Network
LMSIS	Lockheed Martin Space Information Systems
LPA	Logical Port Address
LRDS	Low Rate Data Switch
MA	Multiple Access
MACS	MDM Automated Control System
Mbps	megabits per second
MHz	megahertz
MDM	Multiplexer/Demultiplexer
MIB	Management Information Base
MSFC	Marshall Space Flight Center
MSS	Message Switching System
MUX	multiplexer

Nascom	NASA Communications
NASA	National Aeronautics and Space Administration
NCC	Network Control Center
NLIC	Nascom LAN Interface Card
NMS	Network Nanagement System
NOC	Network Operations Center
NTP	Network Time Protocol
OAS	Onizuka Air Station
PC	personal computer
PI	Principal Investigator
POCC	Payload Operations Control Center
PTP	Programmable Telemetry Processor
RF	Radio Frequency
RTS	Remote Tracking Site
RTP	Real-time Transport Protocol
S/C	Spacecraft
SSA	S-band Single Access
SCD	Small Conversion Device
SDPF	Sensor Data Processing Facility
SHO	Scheduling Order
SN	Space Network
SNMP	Simple Network Management Protocol
SOC	Simulation Operation Center
SPIF	Shuttle POCC Interface Facility
SSO	Space Shuttle Orbiter
STG	System Test Group
STGT	Second TDRSS Ground Terminal
RFSOC	Radio Frequency Simulation Operation Center
TDE	TDRS East
TDS	TDRS Spare
TDW	TDRS West
TCP	Transmission Control Protocol
TDRSS	Tracking and Data Relay Satellite System
UDP	User Datagram Protocol
VER/VAL	Verification/Validation
WSC	White Sands Complex
WSGT	White Sands Ground Terminal